SPECTRA i.Net®

Installation Manual

Spectra i.Net® Installation Manual
Lencore Acoustics Corp.

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Introduction

Welcome to Lencore's Spectra i.Net® system, the intelligent sound masking network!

What makes this system intelligent is its intuitive technology and its infinite flexibility on an open-platform system. The system is suitable for any project size – as large as several million square feet – with its state-of-the-art, networked capabilities for sound masking, music and paging.

The combined innovations of the complete sound masking system – sound sources, speakers, power supply, i.Lon server, central online Sound Manager control and one-touch remote control – put the Spectra i.Net® system on a new level of customization and performance for sound quality, tuning flexibility, and more.

Like every Lencore Spectra® Sound Masking System, the Spectra i.Net® system achieves uniform speech privacy throughout 100 percent of the space, plus sound comfort (critical to ongoing use of any sound masking system).

Installer Benefits

Installing a Spectra i.Net® masking system is faster and easier than any other sound masking system, thanks to Lencore's careful design of system components.

Standard RJ45 connectors are used throughout the system for connecting sound masking speakers and OP to OP. This enables a plug and play installation and reduces the need to strip and connect wires, saving installation time and ensuring a cleaner, debris-free installation. All wiring in the ceiling plenum is kept neat and organized with modular connectors integrated into each speaker and OP.

Simplified connections add to the new system's flexibility. Any changes or additions to the network, such as channel, speaker or OP additions, layout modifications or zone configurations can be made quickly.

For more information about the Spectra i.Net® sound masking system, please visit www.lencore.com, or contact Lencore at (516) 682-9292.

Important Safety Instructions

WARNING – To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

Apparatus should not be exposed to dripping or splashing and no objects filled with liquids should be placed on the apparatus.

1. Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this apparatus near water.

6. Clean only with dry cloth.

7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Only use attachments/accessories specified by the manufacturer.

10. Unplug this apparatus during lightning storms or when unused for long periods of time.

11. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as if the power-supply cord or plug is damaged; liquid has been spilled or objects have fallen into the apparatus; the apparatus has been exposed to rain or moisture; does not operate normally; or has been dropped.

12. Follow COMPLETE instructions for wiring the sound masking system and ALL system checks before powering the system on for the first time, to avoid irreversible damage to the components. Ensure proper polarity for wiring with regard to power, data and audio output.

13. Do NOT plug any Spectra i.Net® devices into a computer or network or like equipment other than Spectra i.Net® devices unless specifically asked to do so in the installation manual.

Section 1 – Basic Information on Sound Masking

You're a Crucial Part of a Sound Decision

Working in an office environment poses a number of challenges to today's workers; among them, performing at high levels with more distractions than ever before to contend with. You have been asked to play a part of the solution to two common and often-neglected problems: privacy and noise.

Privacy and noise are big issues, especially in open office settings with a large number of workstations or cubicles. And notably, in healthcare and related service fields, protecting sensitive patient information is not just a top priority, it is the law.

The good news: utilizing a sound masking system is a cost-effective solution. As a qualified installer, you have become a crucial part of our client's future office environment. The equipment you are installing will play a vital role in not only the privacy of our end user, but in their productivity and ability to concentrate as well. A successful sound masking installation, in fact, should enable the people who work in the environment to perform at their best.

You have been provided with state-of-the-art equipment and technology to install, test, tune and finalize. As such, your goals for the completed installation should be:

- Tuning the system to the proper dB level
- Achieving proper sound uniformity
- Managing expectations for the product
- Leaving the customer with a better, more comfortable workspace

Sound masking involves much more than a series of speakers, switches and wiring hidden somewhere above the ceiling. It has evolved into a science that literally affects the way a workspace *works*.

Congratulations on being asked to perform a vital service for this client. You will leave the workspace a better, more focused place to work. Those who will benefit from your efforts will be better workers, and their companies more efficient, and you will have made a contribution to their future success!

A Brief Look at Sound Masking – Q & A

What is Sound Masking?

Sound masking is a means of adding background sound to a work environment to make conversations more private (speech privacy) and to reduce extraneous conversations and noise.

Masking systems have an integrated sound source, an amplifier, an equalizer, and speakers that produce and carry an electronic sound that should be barely perceptible (non-directional and harmoniously uniform throughout a given space).

How Does Sound Masking Work?

Sound masking works because it changes the 'dynamic range' of sound in an environment.

Typically, the dynamic range in most environments is large, meaning that there is a great degree of difference between the lowest, or ambient, sound level and the highest levels of sound, when people are actively speaking and working. Work environments are perceived as noisy precisely because of this large dynamic range because here, the higher dB sound of normal speech is easily heard in a backdrop of a lower, ambient background sound.

Sound masking works by subtly raising the ambient background sound level, thereby reducing sound's dynamic range. This effectively "masks" unwanted noise, makes speech unintelligible (creating privacy), and makes the work environment acoustically comfortable.

What are the Criteria for Performance?

The sound from a masking system must accomplish two things:

1. It must mask speech (providing measurable speech privacy)
2. It must not be a distraction (must be a "comfortable" sound).

Getting a Comfortable Sound

How do you add sound with a masking system so the system itself is not distracting or annoying? This is the most nuanced aspect of sound masking and consequently, is where most sound masking systems fail.

A sound masking system must be tuned so that the frequencies fall within the preferred sound masking curve with tight tolerances for sound uniformity for all frequencies.

Lencore has mastered these nuances and has asked you to provide the right sound for the project that you are installing. Following the tuning section carefully and please call Lencore's main office if you have any questions.

To learn more about sound masking and Lencore's technologies, visit www.lencore.com, or contact Lencore at (516) 682-9292.

Section 2 – System Equipment (Images & Descriptive)

Sound Source: The OP

The heart of the Spectra i.Net® system is the Operating Platform (OP), the primary sound source that produces, equalizes and distributes to four channels the sound for masking, music and paging. Each OP also:

- Gathers and directs instructions from the central or remote controls to other OPs within the network.

- The OP displays system information, including addresses of specific enclosures using its integrated LCD screen. This aids in locating the correct OP in the ceiling plenum, and eliminates the need for as-built drawings when checking or modifying the system.

As many as six OPs can be connected using only one power supply. Because each channel on the OP functions independently, you essentially get four sound sources per OP. Multiple, random sound masking sources, coupled with Lencore's E-sound™ technology, produce a sound quality that is truly random, with no audible repeats.

Remote Control
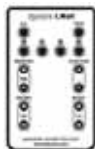
Spectra i.Net's® hand-held remote control enables end users to make immediate volume and contour control adjustments for masking, paging and music by simply pointing at an OP. The remote can also be configured for use at a designated wall location, if desired.

Please note that remote is line of sight. You will notice that the green led stays lit on the OP while remote adjustments are being made.

i.Lon® 100 Internet Server
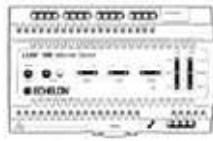

At the head-end of the Lencore sound masking system is the i.Lon® 100 server, which acts as the system's brain. This server features solid construction, plus the flexibility to monitor and control the sound masking system from virtually anywhere.

The i.Lon® 100 allows users to access the sound masking system from a local network, a virtual private network, through the Internet, or directly through the i.Lon® 100's user interface. It has an authentication system that ensures only authorized users are accessing the system. With the i.Lon® 100, the sound masking

i.Lon® 100 is a registered trademark of Echelon Corp.

system can be connected, remotely configured, monitored and controlled from across the room or around the world.   The i.lon measurements are 5 9/16"w x 3 9/16"h x 2 ¼"d

The i.Lon® 100 can also serve as a gateway for a variety of device types. It provides universal connectivity for the devices attached to it, making their data available to corporate IP networks or the Internet, and providing local device monitoring and control via built-in scheduling, alarming and data-logging applications.

The system is capable of performing a complete diagnostic of all its functions, and can report all settings for each of its controlled zones.

Din rail

Din Rail – slotted galvanized steel din rail, length of 8 inches. This rail is used to attach the i.Lon server to the wall

The i.Lon 100 Internet Server mounts to a 35mm x 7.5mm or 35mm x 15mm DIN rail located inside of a suitable, safety-agency approved enclosure, and mounted in a restricted access area. All high-voltage wiring must be performed by a qualified service person. The rear of the i.Lon 100 server enclosure contains a spring-loaded DIN rail lock, which securely grabs the DIN rail onto which the enclosure is snap, mounted. To release the enclosure from the DIN rail, insert a flathead screwdriver into the DIN rail locking tab and gently pull the tab upwards and away from the enclosure.
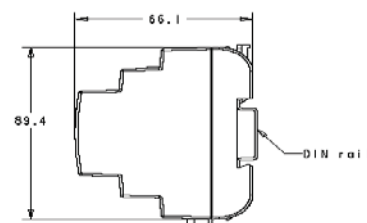
Power Supply

The Spectra i.Net® sound masking system utilizes a 48-volt DC power supply unit that is capable of powering as many as six sound sources (or Ops) and features:

- Universal AC input/full range
- Built-in active PFC function (PF>0.93)
- Protections: short circuit/overload/over voltage/over temperature
- Built-in constant current limiting circuit
- Optional remote on/off control
- LED power "on" indicator
- 100% full load burn-in test
- Fixed switching frequency at PFC: 67 KHz PWM: 134 KHz
- 3-year warranty
- AC input 100-240 VAC 50/60 Hz

Power Supply Brackets

The power supply can be installed using 3" long L-brackets, held by #8-32 x 3/8", zinc plated, panhead machine screws.

Some local codes require that all appliances be contained in an electrical box. The i.Lon and power supply will fit in a 12" x 12" x 6" deep box with a door. All appliances and rails will fit this size.

Data/Audio Terminator

The Spectra i.Net® data terminator is used at the last OP unit to end the OP data run and paging and music channels. One terminator is used for each project requiring a data, paging or music hook-up. The data terminator is constructed of brushed aluminum and houses a PC board. It is clicked into the last OP's "OUT" data port.

Data Terminator contains a wire strap to mechanically secure terminator to the last OP taking the weight off the RJ45 hookup. THIS WIRE STRAP IS NOT A Ground strap or electrical wire.

Music Paging Interface (MPI)
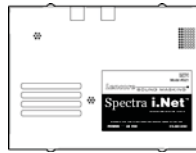
Lencore's sound masking systems can easily provide paging and music with a few simple additions using a telephone connection or music RCA connection – virtually giving you two systems (masking and paging) for the price of one.

The advantages of Lencore's paging and music capabilities include:

- Paging and music volume adjusts independently of masking volume control, with Lencore's IndePage™ technology.

Note: When working with the MPI be sure to utilize a ground strap to insure that a common ground is maintained between all system components.

- Paging and music come through uniformly, with no "hot" and "cold" spots common to other systems.

- No abrupt "starts" and "stops" because Lencore's paging is programmed to smoothly override masking.

The MPI has two separate audio channels (one for paging, one for music) and through the MPI board, permits zoned paging and/or music with the customers' own telephone system.

Speakers

Speakers used in the Spectra i.Net® system are configured with integrated RJ45 connections for plug and play and ease of installation. The speakers feature an aluminum housing, 5-inch wide dispersion and weigh approximately three pounds each.

In certain applications and site conditions, a direct field speaker or inverted speaker may be necessary. Lencore provides this option with all of its sound masking systems.
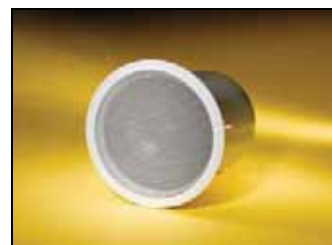
Wire

The Spectra i.Net® system uses Cat 5e/5E and RJ45 connectors for audio and data connections.

> **Helpful Hint:**
> Use different colors for your Cat 5e/5E cables to easily identify audio vs. data cable runs.

Audio Cable (cable from OP to speakers and speaker to speaker)
The pin out on the RJ45 is <u>straight</u>.
The connectors for the audio cables are non-plated.

Data Cable (cable from i.Lon to MPI to OP1 and OP to OP)
The pin out on the RJ45 is <u>straight</u>.
The connectors for the data cable are plated.

TIA/EIA – 568-B wiring is standard

Pin 1 and Pin 2 are the network wires (orange wires)

Pin 3 and Pin 6 are for initialization (green wires)

Pin 4 and Pin 5 are for paging (blue wires)

Pin 7 and Pin 8 are for music (brown wires)
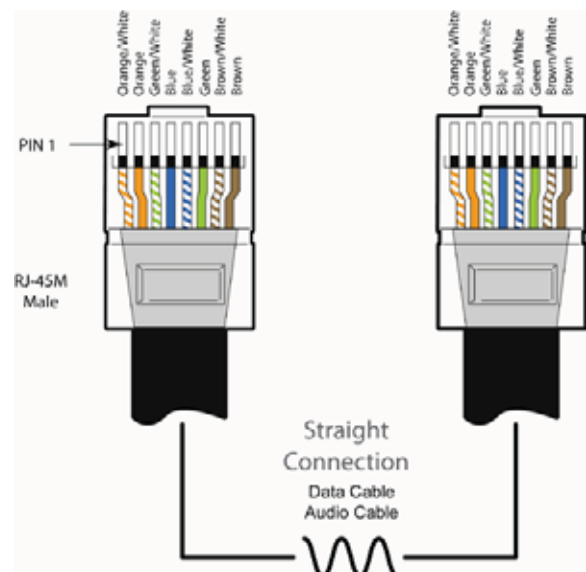
NOTE: Lencore recommends "long throat" connector types for integrity and ease of use.

Audio Wire Connection (RJ45)
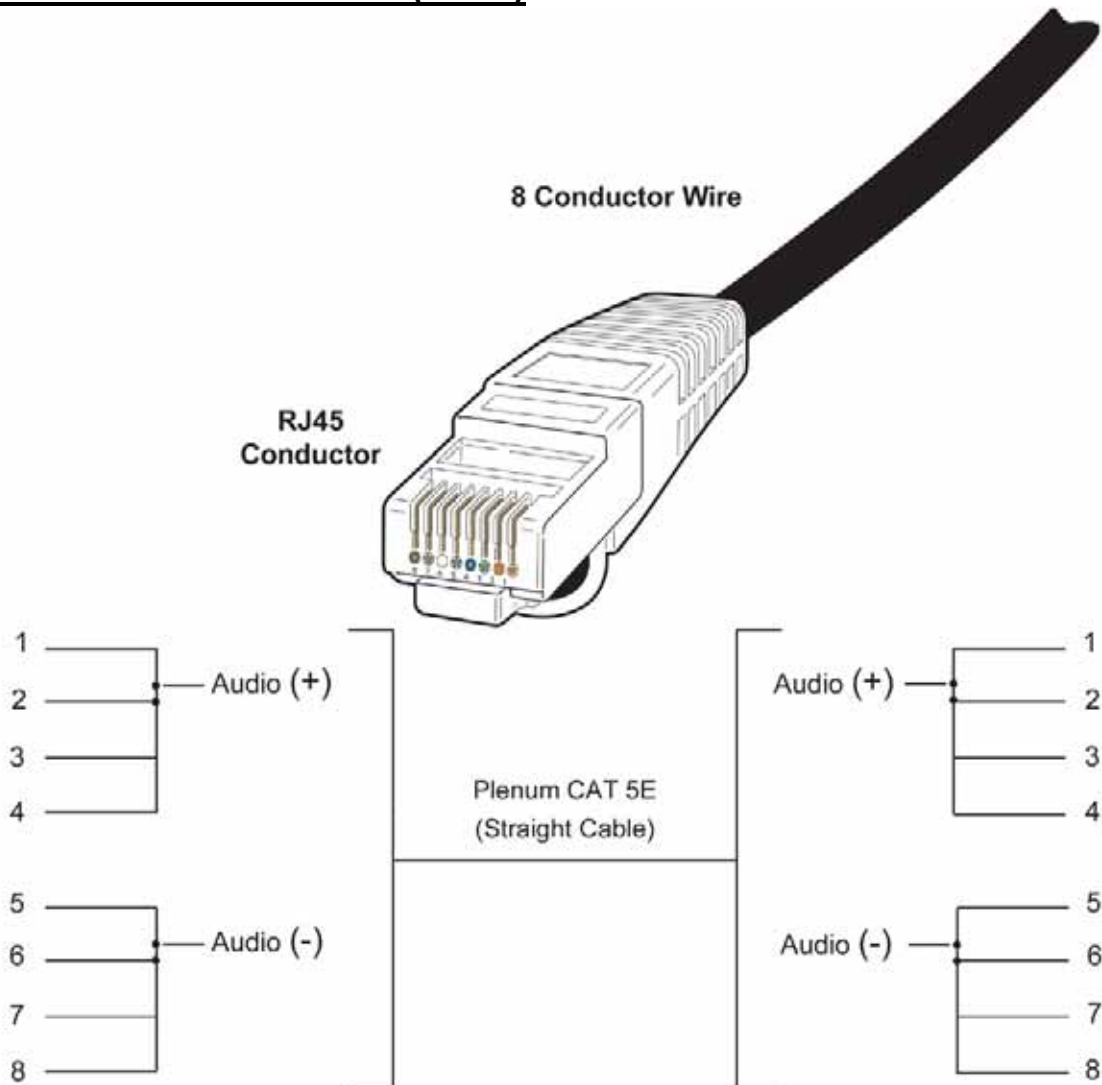
8 Conductor Wire

RJ45
Conductor

Plenum CAT 5E
(Straight Cable)

Left Pins		Right Pins
1		1
2	Audio (+)	2
3		3
4		4
5		5
6	Audio (-)	6
7		7
8		8

Pins - 568 B

1 - Orange/White ⎤
2 - Orange   ⎥ (+)
3 - Green/White   ⎥
4 - Blue   ⎦
5 - Blue/White   ⎤
6 - Green   ⎥ (-)
7 - Brown/White   ⎥
8 - Brown   ⎦

Helpful Hint:
Use different colors for your Cat 5e/5E cables to easily identify audio vs. data cable runs.

Data Wire Connection (RJ45) 568B

Pins - 568 B

1 - Orange/White
2 - Orange
3 - Green/White
4 - Blue
5 - Blue/White
6 - Green
7 - Brown/White
8 - Brown
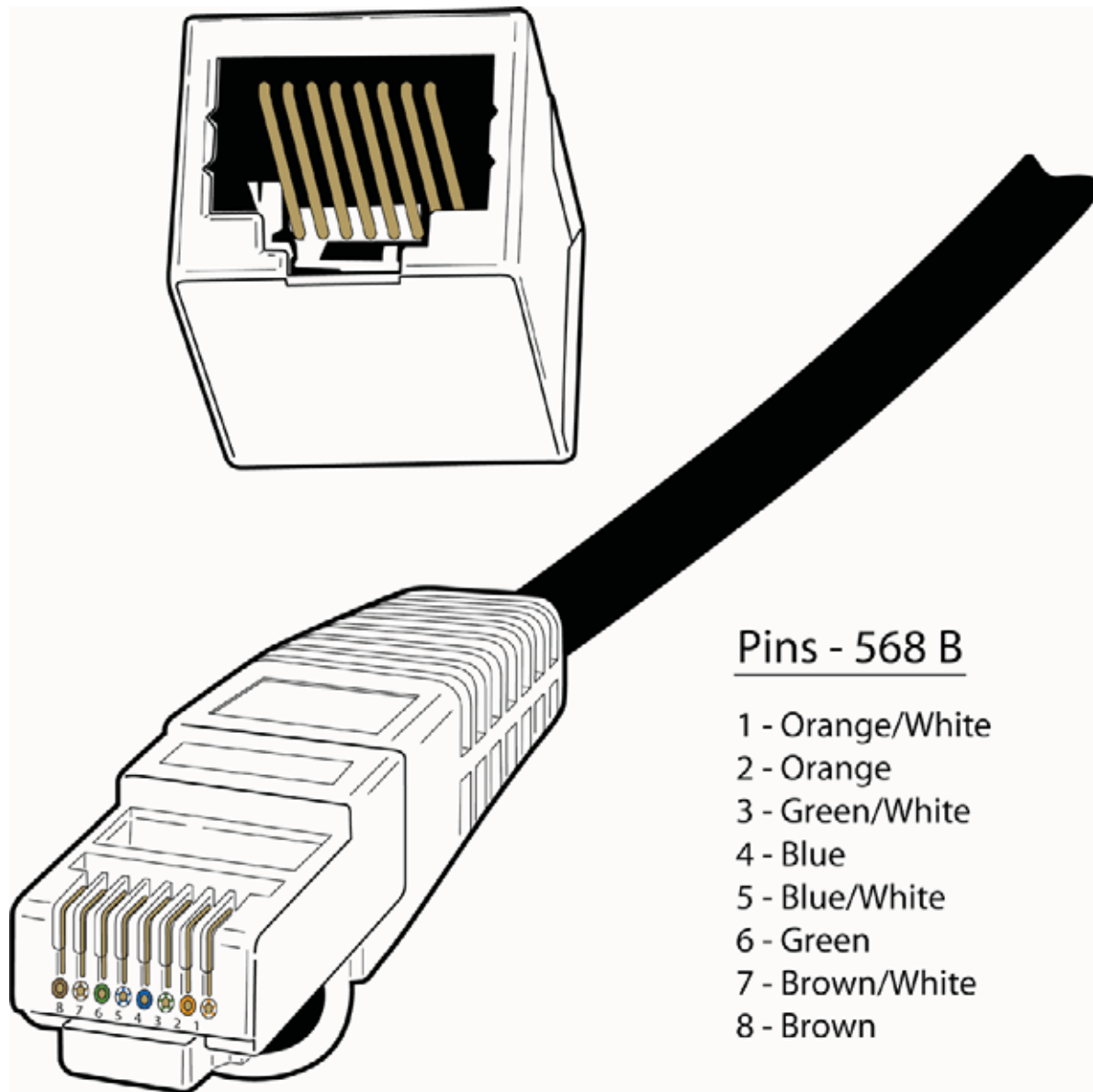
1 - LON A } ILON®100/ MPI BOARD DATA NETWORK
2 - LON B
3 - INITIALIZATION (SEQUENCER) - MPI BOARD
4 - PAGE (+) } BALANCED PAGE 1-VRMS
5 - PAGE (-)
6 - INITIALIZATION (SEQUENCER) - MPI BOARD
7- MUSIC (+) } BALANCED MUSIC 1-VRMS
8 - MUSIC (-)

Router
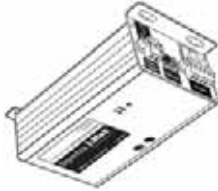
At every 30th OP a router is typically needed, for example a router is used between the 30th and 31st OP to insure consistent data transmissions.

Connecting from the OUT data port of the 30th OP connect the data cable to the router.

Exit the router by the data out and connect to the next OP (31st) via the OP's data in using an integrated RJ45 connector.

NEVER PLUG A SPECTRA i.NET ROUTER INTO ANY COMPUTER OR NETWORK OR LIKE DEVICE OTHER THAN A SPECTRA i.NET EQUIPMENT. DAMAGE TO A COMPUTER OR LIKE EQUIPMENT COULD OCCUR.
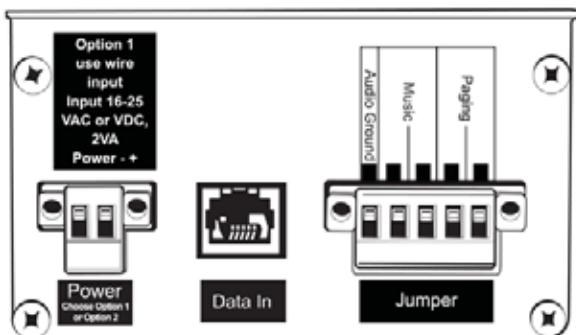
Data In   Data Out
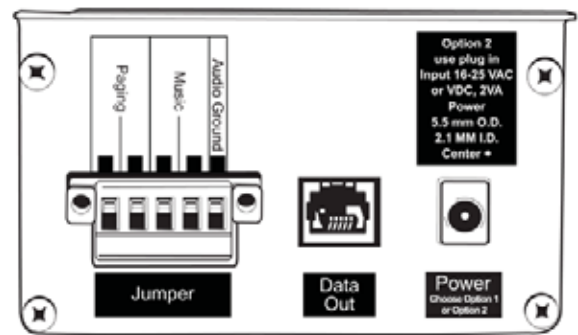
Data In Side   **Data Out Side**

IR Hub

Each OP is equipped with an integrated infrared eye on the bottom of the OP enclosure allowing remote usage and connectivity. Using the Spectra i.Net hand-held remote control point the remote to the bottom of the OP enclosure for IR line of sight control. Adjustments to the OP may be made from the remote control for masking volume and masking contour or paging volume or music volume by either single audio channel or entire OP.

Each OP is also equipped with an IR port on the side of the OP enclosure. This port allows an IR wall plate eye to be installed via plenum rated CAT 5e wire and an RJ45 connector from the OP located in the ceiling plenum to the space below the plenum, in a location along a wall, similar to that of a normal wall switch. This setup allows for IR remote control use without having to remove a ceiling tile.

The IR Hub is an additional component that allows for more than one wall switch plate to be installed in an OP IR port giving a single OP audio channel specific control to a respective wall plate. Up to four wall switch plates may be installed in each hub allowing four switch plates to be installed per each OP
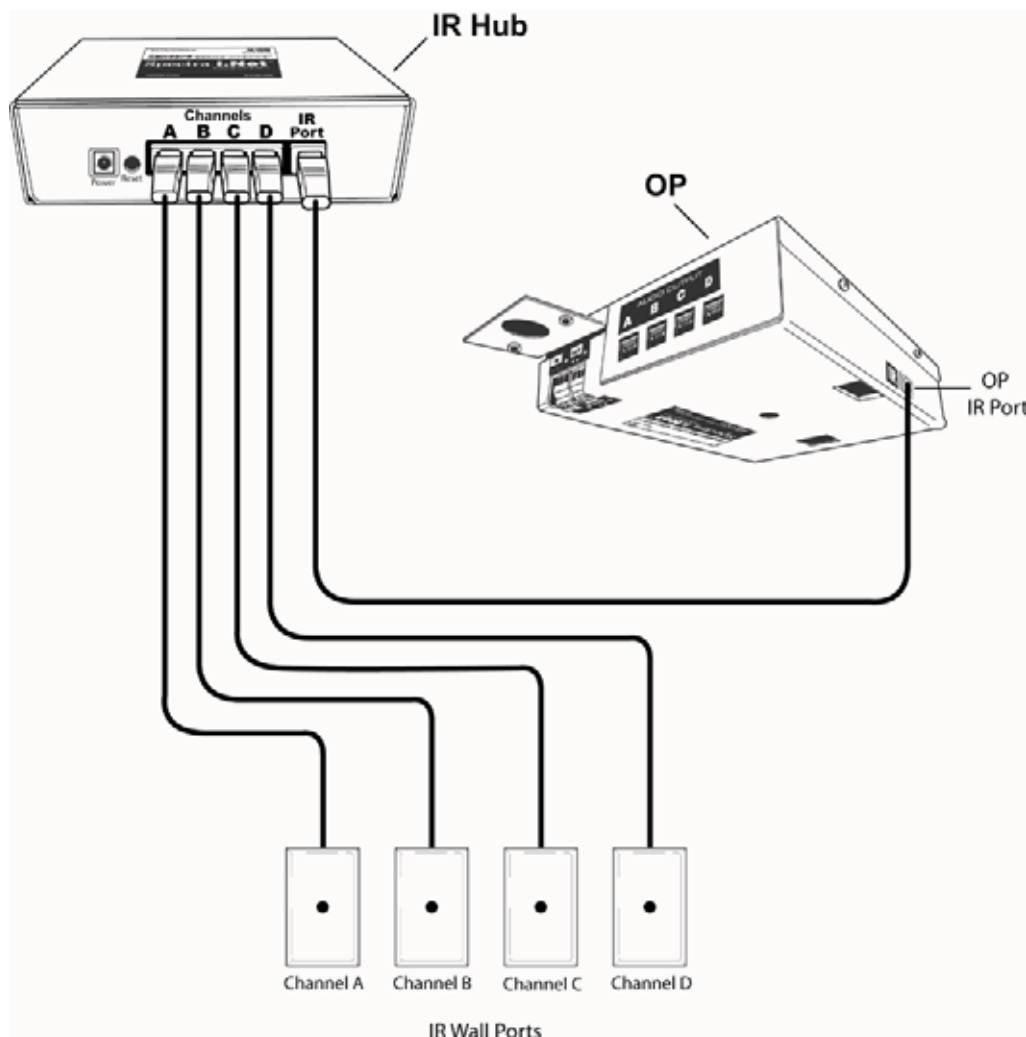
Ring-down Unit

A ring-down unit is used to connect a telephone trunk line to the MPI for telephone paging. The ring-down unit acts as central telephone office (co).

For internal ring-down settings, see page 33.

TELEPHONE HOOKUP TO MPI
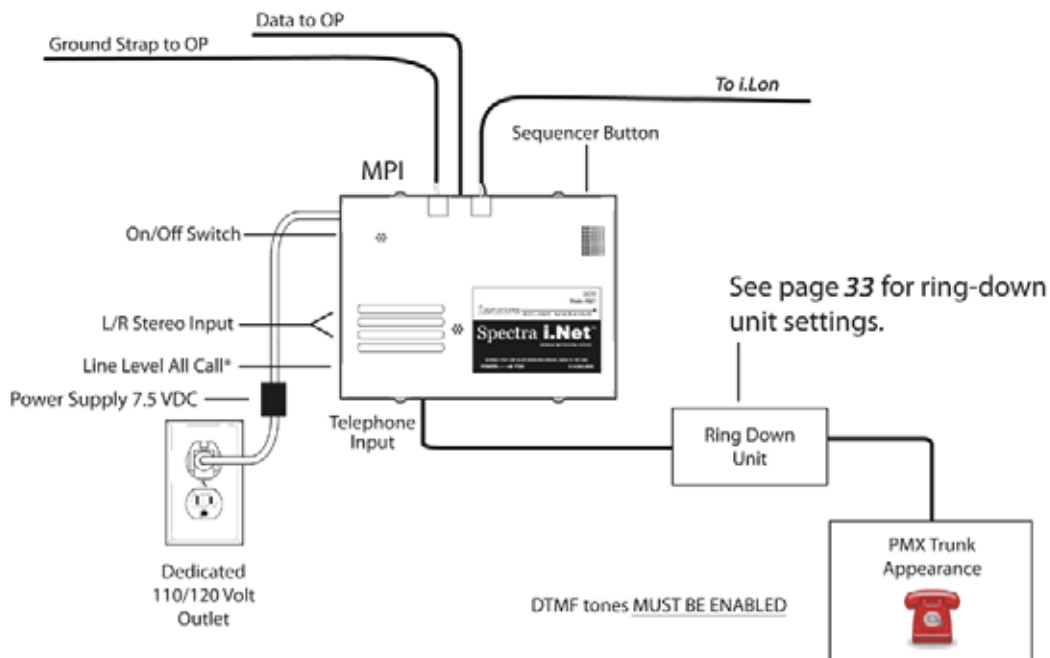
PMX TRUNK APPEARANCE USING A RING-DOWN UNIT

Data to OP
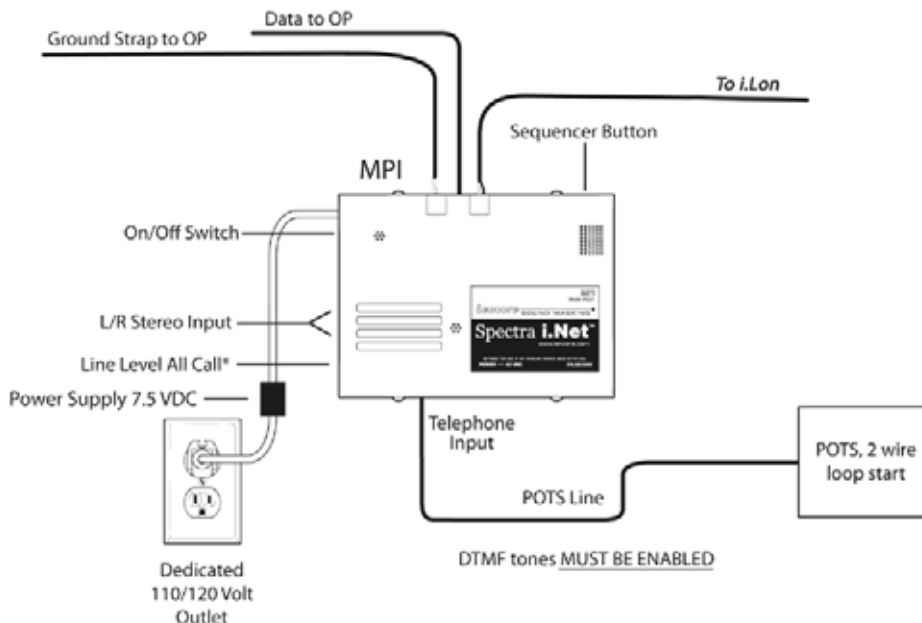
Ground Strap to OP

To i.Lon

Sequencer Button

MPI

On/Off Switch

L/R Stereo Input

Line Level All Call*

Power Supply 7.5 VDC

Spectra i.Net™

See page *33* for ring-down unit settings.

Telephone Input

Ring Down Unit

Dedicated 110/120 Volt Outlet

DTMF tones MUST BE ENABLED

PMX Trunk Appearance

DIRECT POTS LINE (WITHOUT RING-DOWN UNIT)

Data to OP

Ground Strap to OP

To i.Lon

Sequencer Button

MPI

On/Off Switch

L/R Stereo Input

Line Level All Call*

Power Supply 7.5 VDC

Spectra i.Net™

Telephone Input

POTS, 2 wire loop start

POTS Line

Dedicated 110/120 Volt Outlet

DTMF tones MUST BE ENABLED

A POTS line is a 2 wire analog appearance that usually originates at a telephone company central office.

1) It is a 2 wire (Tip and Ring) analog appearance.
2) It is configured to be loop start.
3) Battery voltage is 48 Volts.
4) Loop current of 23 milli amps.
5) Must have DTMF signaling capability.

Section 3 – Tools and Equipment Needed

Prior to beginning the install of the Spectra i.Net® System, be sure to have the following equipment and tools:

- Installation drawing showing OPs, speakers, head-end equipment wiring and channel designations (i.e. channel A, B, C, D)

- Laptop computer downloaded with JAVA™ and data wire for Ethernet connection to the i.Lon

- Angle Brackets

- Cable tester (for Cat 5e/5E cables for RJ45 heads)

- Din Rail

- Extension cord

- Extra RJ45 Connectors (long-throat connectors preferred)

- Extra Screws

- Extra Wire (plenum-rated wire)

    - Power cables: 16-gauge, two conductor cable
    - Data cables: 4-pair Cat5e/5E or equivalent
    - Audio cables: 4-pair Cat5e/5E or equivalent

- Flashlight/Headlamp

- Highlighter and magic marker

- Ladders (check height of ceiling and plenum for appropriate ladder height)

- Method for hanging

    - Hilti-gun or any powder-activated fastening gun or drill and screw. Follow local codes for preferred installation method.

- Pen, pencil

- Plenum Wire Wraps/Ties

- Pliers

- Rubbish Removal/Debris Bag

- Small Flat Head and Phillips Head Screwdrivers

- Sound Level Meter (Simpson® Model 884-2)

- Tool belt

- Vacuum

- Volt/Ohm Meter

- Walkie-talkies (2) + charger

- Wire crimper

- Wire cutter

- Wire labelers

- Wire stripper capable of stripping down to 24 gauge wire

- Work gloves

Note: Be sure to check to verify all national and local electrical codes and procedures for proper installation of all power supplies and sound masking equipment.

Section 4 – Step-by-Step Installation Instructions

Preparation

1. Review boxes. Refer to packing list and check equipment in boxes.

    Be certain you have:
    - All OPs – Please secure all OP's to a very safe place. OP's are expensive items.
    - i.Lon (make sure you secure the i.Lon – approximate cost $1K)
    - The terminator(s). Keep these in a safe place.
    - Power supplies, routers, MPI
    - Speaker boxes

Reminder:
Secure all OP's, MPI and i.Lon and equipment on site. Store Securely & Safely.

OP's, MPI and i.Lon are expensive items!

Count all the items to ensure that you have all of your equipment.

Open speaker boxes to properly count the number of speakers you have.

2. Review Wiring and Installation Drawings:
    - Verify where wiring will be installed BEFORE placing equipment. Check wiring runs to properly estimate needed quantity of wire for the project.
    - Check quantity for: Power Wire (16/2), Data Wire (CAT 5e, 4 pair), Audio Wire (CAT 5e, 4 pair).
    - Verify where OPs and speakers will be installed.

3. Preview location for placing the head end equipment (electrical or IT closet) – make sure that you have access to power in the closet. Follow all safety precautions.

    Check for and identify intended placement for the:
    - i.Lon (attached to Din Rail)
    - MPI
    - Power Supplies

4. Identify any major site impediments such as:
    - Slab-to-slab wall
    - Shafts
    - Risers (wiring raceways from floor to floor)
    - Obstructions in plenum
    - Etc.

OP and Speaker Placement

1. Place Spectra i.Net[®] speakers by walking the floor and set the speakers on the floor at approximate installation locations.

2. Place OPs on the floor at approximate locations (check drawing for correct sequence). Make sure the OPs are not put in harm's way of people working or walking.

NEVER PLUG AN OP INTO ANY COMPUTER OR NETWORK EQUIPMENT OTHER THAN AN i.Lon or OP.

Installation

IMPORTANT: Lencore suggests installing equipment in this sequence:

1. Hang speakers[*1]
2. Hang Ops
3. Run wire with power OFF

 ATTENTION: Do not hook up power until the system is fully installed.

Power connections must be double-checked to ensure proper polarity.

CRITICAL

CHECK WIRING POLARITY (+ AND -) BEFORE FIRING THE SYSTEM ON, OTHERWISE, IRREVERSIBLE DAMAGE WILL OCCUR TO SOME OR ALL OF THE OPs.

[*1] Speaker units will hang from the ceiling using the attached chain (supplied by Lencore). Chain length should be cut to enable each speaker to hang a **minimum of 6" above the ceiling tile and a maximum of 12" above the ceiling tile, unless otherwise noted on the drawing.**

NOTE: To help maintain uniformity, wherever possible, keep the chain lengths/heights consistent throughout the installation and space.

1. Hang Speakers

1. Climb ladder and access the ceiling plenum

2. Hang speaker units in plenum area at marked locations using preferred hanging method (powder action gun such as a Hilti-gun™ or drill and screw; check your local building codes for allowable hanging methods and standards)

3. Drive a nail holding the clip with the speaker chain and speaker into ceiling

4. Pull and connect audio cables to speakers by channel (refer to Section C Wiring)
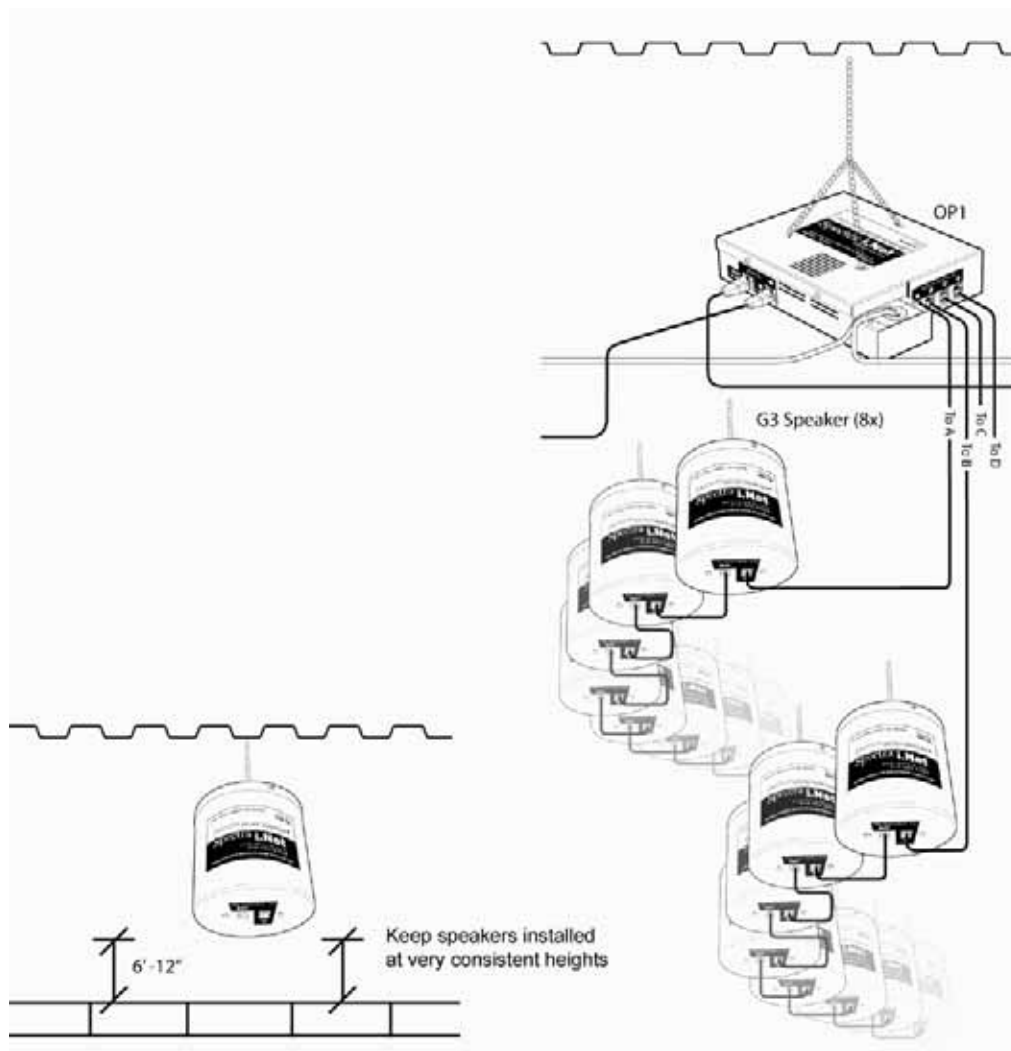
CAUTION: Follow channel designations on drawings (A,B,C and D) so that proper tuning of the system can take place. Any changes to the system MUST be designated on the drawing.

2. Hang OPs

You may have received OPs pre-numbered – see label on each OP indicating its sequence number. Check and install each respective OP according to the drawing.

OPs are hung from the ceiling using the attached chain (supplied by Lencore). Chain length should be cut to enable each speaker to hang a *minimum of 8" above the ceiling tile* or 3" below the ceiling deck. Make sure air can circulate around the OP and that the OP is not touching metal in the ceiling or plenum.

> **NOTE:** Keep the chain lengths/heights consistent throughout the installation and space.

A. Climb ladder and access the ceiling plenum

B. Hang Ops in plenum area at marked locations using preferred hanging method (powder action gun such as a Hilti-gun™ or drill and screw; check you local building codes for allowable hanging methods and standards)
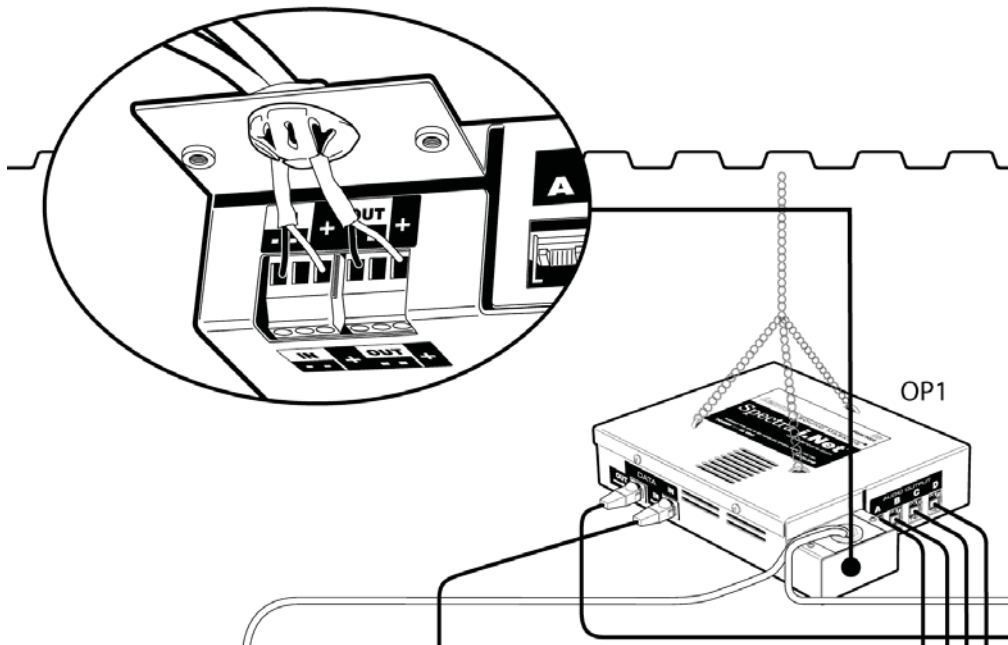
C. Drive nail holding clip to OP chain and OP into ceiling

> **NOTE:** Do not permit the OPs to touch any other metal in the ceiling. Isolate each OP with wire ties.

3. Wiring the Speakers and OPs

       Power cables (16 gauge/2 conductor – Plenum Rated)
       Data cables (CAT 5e or equivalent – 4 pair – Plenum Rated) – Straight Pin
       Audio cables (CAT 5e or equivalent – 4 pair – Plenum Rated) – Straight Pin

Preparation

A. Check site drawing for wiring installation diagram

B. Use wiring diagram to determine approximate wiring lengths:

       Approximately 25' between speakers (Cat 5e - 4 pair)
       Approximately 125' between OPs (power and Cat 5e – 4 pair)

IMPORTANT: Double-check for long home runs and runs between floors, as these will require much longer lengths of wire. Check wiring schematics for your project.

C. For more detail about system wiring, see Section 7 – Wire Schematics

Power Cables

Power cables are plenum-rated, 16-gauge, two conductor cable

One power supply powers as many as six OPs. When wiring a network with more than six OPs follow directions for wiring between power zones. Regardless of OP's an additional power supply will be used between floors.

WARNING

NOTE: Do NOT activate power until the Power wires are checked for proper polarity and all the OPs are wired for power in a power zone. DO NOT SKIP THIS STEP!!! If proper polarity is NOT maintained, then irreversible damage to the OPs will occur.

DO NOT CONNECT OR DISCONNECT OPs WITH LIVE WIRE as injury and shock may occur, and damage may be caused to the sound masking equipment.

1. First, run power cables to the IN/OUT connections of each OP, taking care to be consistent with positive and negative screw terminals.
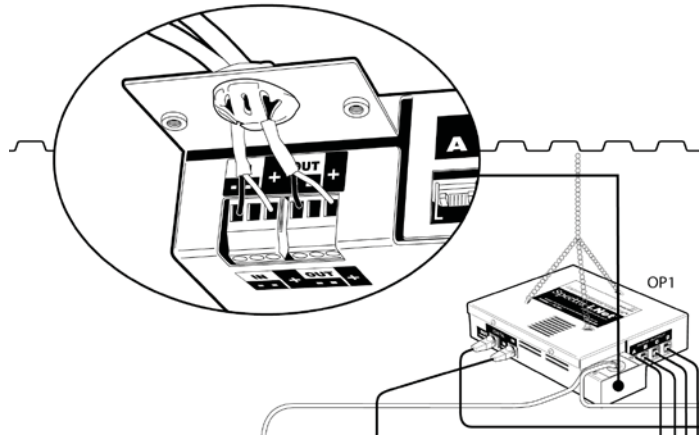
Do NOT cross positive and negative connections while wiring power- irreversible damage will occur.

2. Run the power cables (NOT LIVE) from the power supply unit in the electrical/IT closet to the power +/- screw terminal connections of the first OP.

3. Complete all other wiring (audio and data) and perform wiring checklist (see page 35) BEFORE powering up the system.

WARNING

NOTE: Make sure that grounds are connected to grounds and positives to positives, and that wires are not crossed anywhere in the entire system. Double check the wiring at each power supply.

Follow all labeling for power.

POWER SUPPLY

Dedicated 110/120 Volt Outlet

High Voltage

Low Voltage

SP-150-48

Black
White
High Voltage
Low Voltage
Green
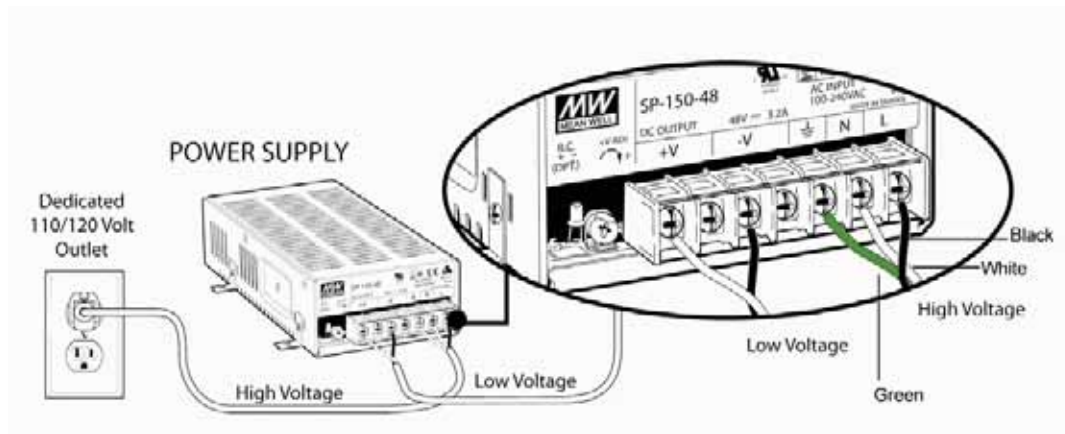
When Adding Additional Power Supplies

When a new power supply needs to be added:

Typically, a new power supply is needed after every sixth OP or when a run goes to a different floor. The correct wiring method is described below in diagram form.

> Example: Power Zone 1: OPs 1-6 (one power supply)
> Power Zone 2: OPs 7-12 (two power supplies)
> Power Zone 3: OPs 13-18 (three power supplies)
> Etc.

Wiring Between Power Zones:

1. Wire the sixth OP to the seventh OP using only the ground (negative or conductor) wire. DO NOT CONNECT THE POSITIVE WIRE.

2. Use this method to tie all grounds between power zones.

3. Add additional power supply and install 16/2 from power supply low voltage side into OP in +/- maintain polarity!

NOTE: Be sure **grounds** are run between power zones.
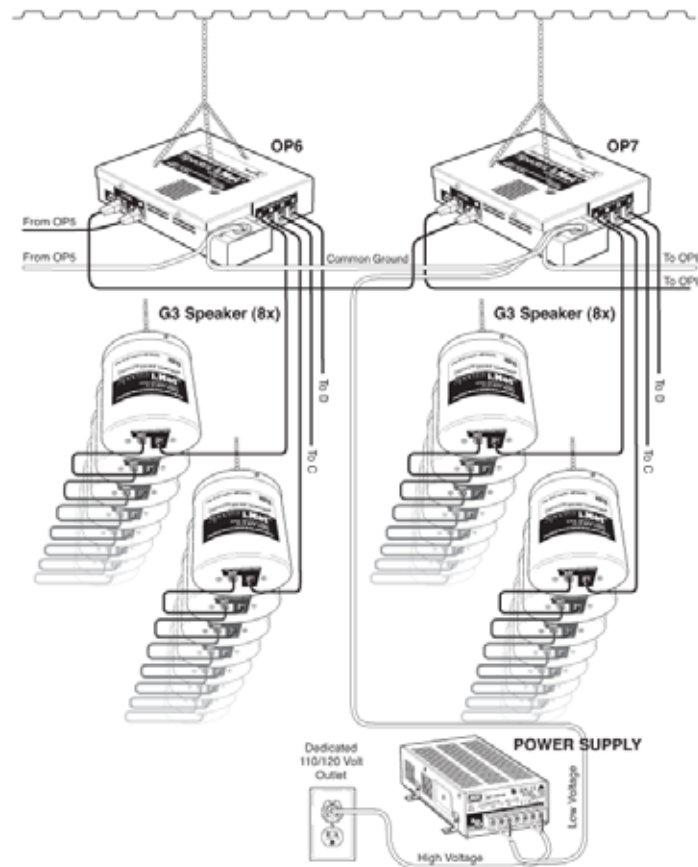
Data Cables

Data cables are 4-pair CAT 5e or equivalent

- Must be plenum-rated
- Straight-pin cable (Pin 1->1, Pin 2->2, Pin 3->3, Pin 4->4, Pin 5->5, Pin 6->6, Pin 7->7, Pin 8->8)

Data connectors: RJ45

NOTE: Do NOT run data cable along side power wires. Data wires must run at right angles to power wires found in the plenum. Follow all proper procedures & local codes.

TIA/EIA 568-B Configuration
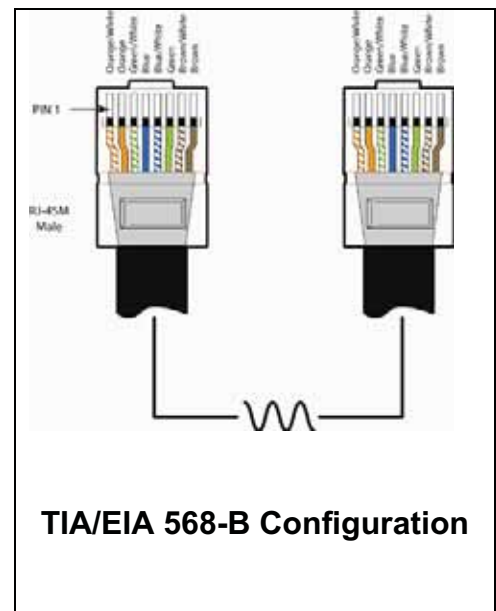
1. Run data cable from the i.Lon® network hub or MPI in the electrical/IT closet to the first OP and continue with the data wire from each OP in sequence.

2. **Before use check and test all cables**. Use a cable continuity tester. DO NOT SKIP THIS POINT! This easy step will resolve most of any problems associated with the installation and will save you significant time if you need to trouble-shoot the system.

3. Place the data cable into the first OP's data IN jack (female RJ45).

4. Place another data cable from the first OP's data "OUT" jack to the data IN jack of the second OP.

5. Continue connection from OP to OP in numbered sequence. You may NOT skip a sequenced OP (i.e., connect OP 1 to 4). Keep OPs sequenced, even if you swap OPs on a wired route. (If you swap an OP, please designate the swap with notes on drawing so that the as-built drawings may be properly referenced.)

6. At the last OP:

   - Run the last data cable to the IN jack of the last OP in the project.

   - In the last OP, click the Data Terminator into the DATA OUT jack. This should only be installed in the last OP.

See diagram on the next page showing a data terminator installed in the very last OP.

The terminator enables the networked system to identify the last OP as the final data recipient in the chain, and thus terminate the message relay.

Audio Cables

Audio cables are 4-pair CAT 5e or equivalent

- Must be plenum-rated
- Straight – pin cable (Pin 1->1, Pin 2->2, Pin 3->3, Pin 4->4, Pin 5->5, Pin 6->6)
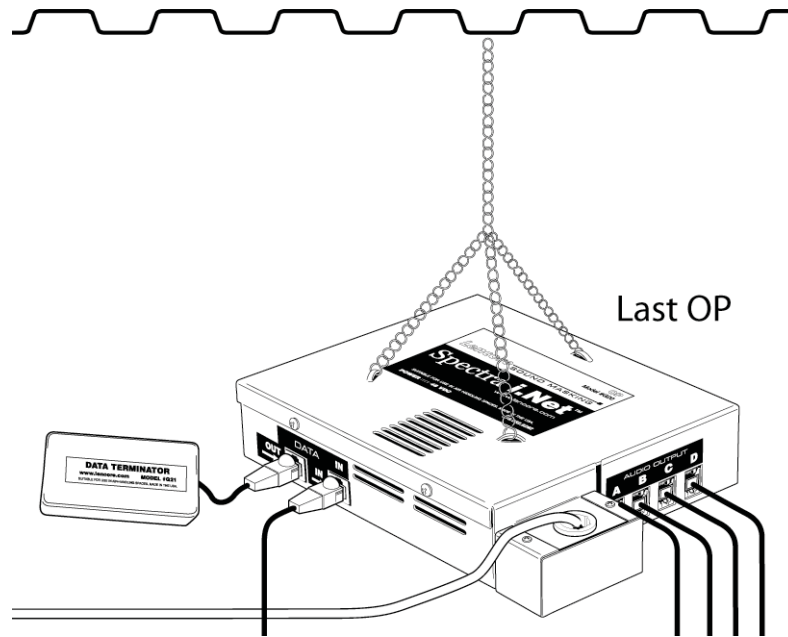
Audio connectors: RJ45 – MAKE SURE YOUR CONNECTOR CAN ACCEPT 8 WIRES (4 PAIR)
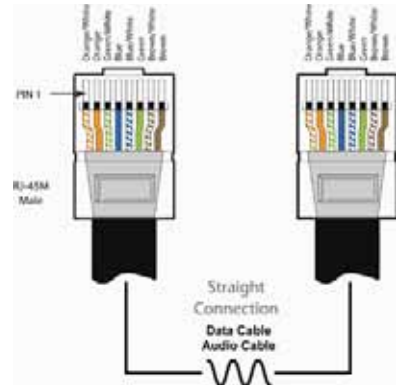
Important Wiring Information

- Each OP has four channels for audio cables, Channels A,B,C, D

- Each channel supports 1-8 speakers, for a total of up to 32 speakers per OP.
    - Wiring by channel, as specified by Lencore, permits proper system zoning and tuning.

1. Run audio cable with RJ45 (4 PAIR) connectors from each channel (A,B,C,D) on the OP to the speakers listed on the drawings.
    a. Make sure that your audio runs match the drawings for three very important reasons:
        I. First, the speakers and channels have been specially laid out to accomplish the right sound in the environment you are installing the sound masking. For example, you will most likely notice that the speakers on a channel stay in "like" space, i.e., a channel will have all of its speakers in either an open-plan space, a closed-plan space, an individual conference room, etc.
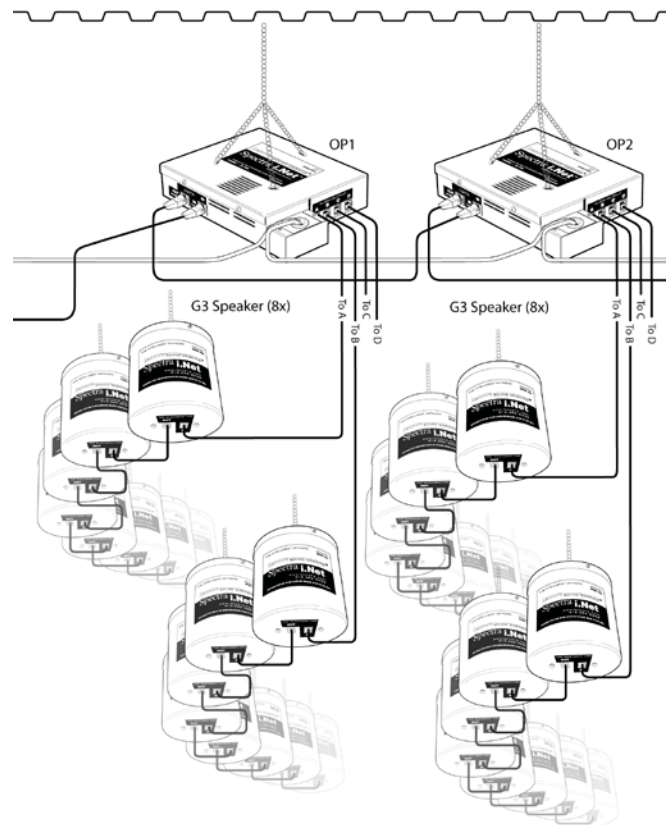
II. Second, to properly tune the space after installation, the channels – per the drawings – need to be clearly referenced to understand where the speakers are when tuning from the electrical closet using the central control server (the i.Lon® 100).

III. Third, this method ensures that proper groups can be arranged on the i.Lon® controller.

2. Connect the audio cable to the IN jack designated at the bottom of the speaker can.

   TEST CABLES BEFORE INSTALLING – USE APPROPRIATE CABLE TESTERS

3. Run audio cable from the OUT jack of the same speaker can to the next corresponding IN jack of the next speaker for *that channel*.

4. Continue this sequence until all of the speakers in the channel run are completely wired.

NOTE: Keep channels EXACTLY as marked on drawing.

Section 5 – Head End Equipment Installation and Providing Power to the Network

When all speakers and OPs are properly hung, install the head-end equipment in the electrical/IT closet

Head End Equipment for Electrical Closet:

- Din rail
- i.Lon® 100 Server
- Music and Paging Interface (Optional Equipment)

Power Equipment:

- Power supply

1. Electrical Requirements

– One dedicated 120v/20 Amp circuit is suggested for the i.Lon network server hub.

– One dedicated 120v/20 Amp circuit is suggested for each power supply.

– One each dedicated 120v/20 Amp circuit is suggested for the MPI and ring-down unit (if necessary).

WARNING

NOTE: Never use a ground lifter. Always use a proper three prong adapter for safety.

2. Installing Head End Equipment (Din Rail and i.Lon)

A. Install din rail to the wall in the appropriate location in the electrical or IT closet.

B. Attaching the iLON®, using the din rail for support, attach the back of the i.Lon® network hub directly onto the rail.

3. Installing the MPI (Optional)

The Music and Paging Interface (MPI)
The MPI is an optional system component. It sequences the OPs and has inputs for:

- The i.Lon® network hub
- Music
- Paging

Follow these steps to install the MPI:

1. Mount the MPI to the wall

2. Connect the MPI to the i.Lon® using two conductor/one pair wire (16 gauge). Connect each wire to the screw terminal on bottom of MPI to the i.Lon®.

   i.Lon Connections
   - One wire to #17 (LON® B/PLT-)
   - One wire to #18 (LON® A/PLT+)

   When installing the i.Lon®'s data connection to the MPI, polarity is unimportant, however, make sure the two wires at the screw terminals are clean and not touching or crossed.

3. Coming out from the MPI, use a data cable, 4-pair CAT 5E or equivalent with an RJ45 connector. Plug into the 10/100 Ethernet base connection from the MPI to the data IN port of the first OP.

   You must also connect a ground wire from the MPI to the OP that Connects the MPI ground to the OP ground.

   See the MPI label to verify which audio or paging input you may need and to connect appropriate music source or phone page into the MPI.

Connecting System to MPI – See larger diagram on page 49
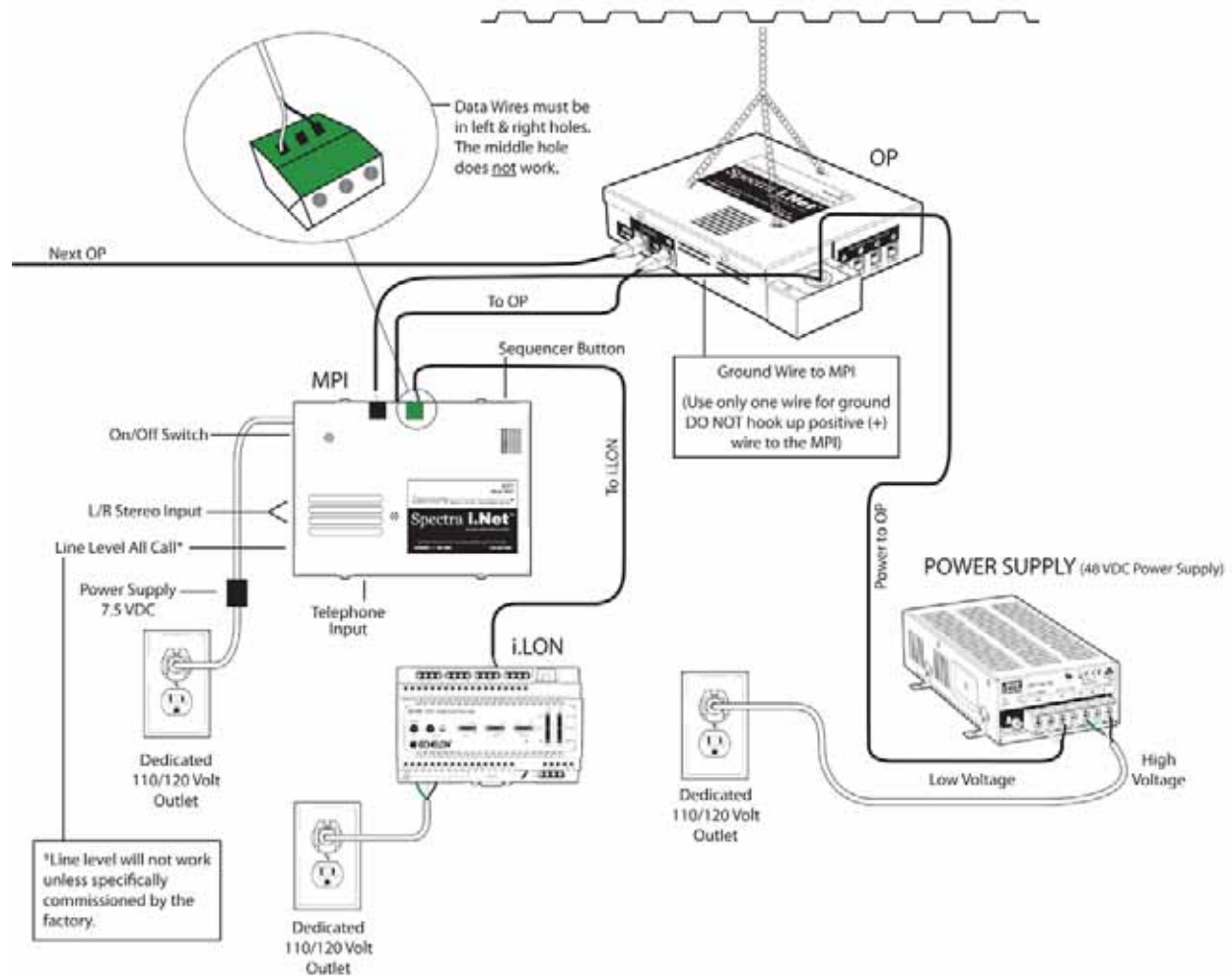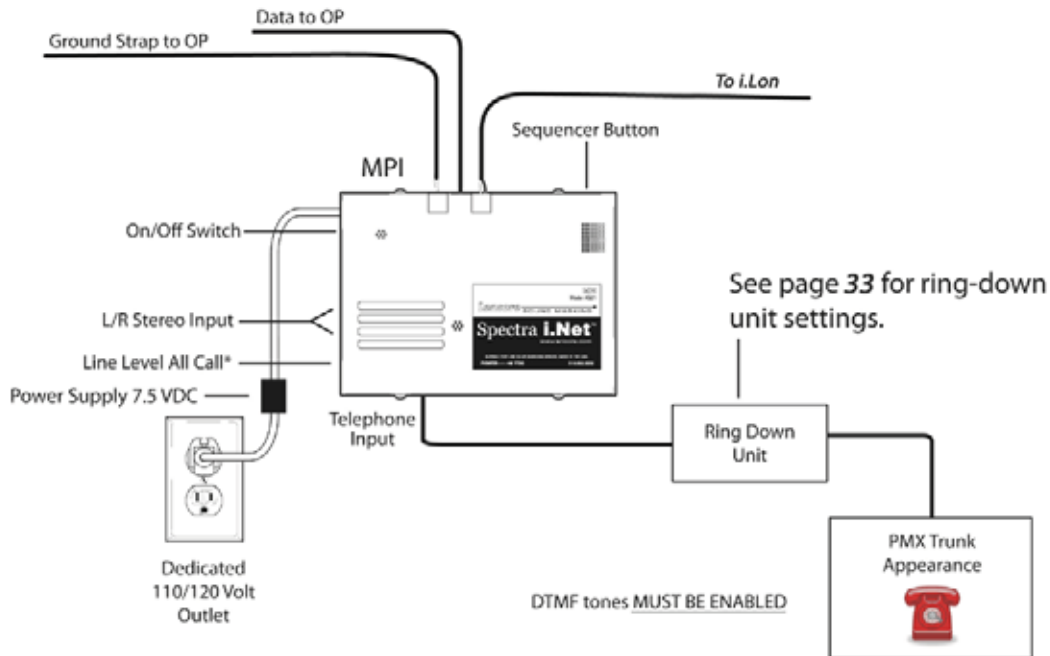
- 31 -

Data Wires must be
in left & right holes.
The middle hole
does *not* work.

OP

Next OP

To OP

Sequencer Button

MPI

Ground Wire to MPI

(Use only one wire for ground
DO NOT hook up positive (+)
wire to the MPI)

On/Off Switch

To iLON

L/R Stereo Input

Line Level All Call*

Spectra I.Net

Power to OP

POWER SUPPLY (48 VDC Power Supply)

Power Supply
7.5 VDC

Telephone
Input

i.LON

Dedicated
110/120 Volt
Outlet

High
Voltage

Dedicated
110/120 Volt
Outlet

Low Voltage

*Line level will not work
unless specifically
commissioned by the
factory.

Dedicated
110/120 Volt
Outlet

TELEPHONE HOOKUP TO MPI

PMX TRUNK APPEARANCE USING A RING-DOWN UNIT

See page 33 for ring-down unit settings.

DTMF tones MUST BE ENABLED

DIRECT POTS LINE (WITHOUT RING-DOWN UNIT)

DTMF tones MUST BE ENABLED
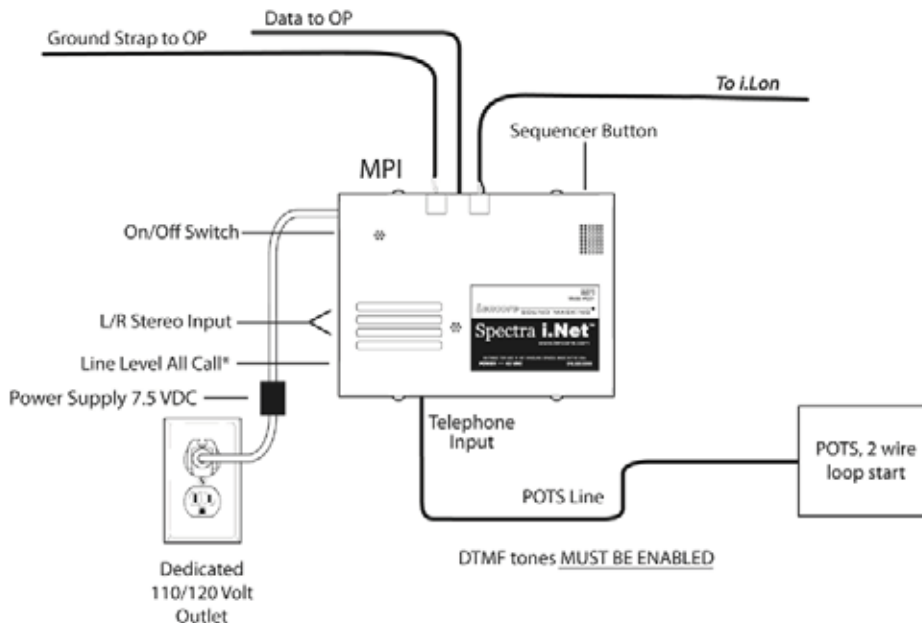
A POTS line is a 2 wire analog appearance that usually originates at a telephone company central office.

1) It is a 2 wire (Tip and Ring) analog appearance.
2) It is configured to be loop start.
3) Battery voltage is 48 Volts.
4) Loop current of 23 milli amps.
5) Must have DTMF signaling capability.
6) Configure POTS line with enabled hang-up (wink) supervision (current remove).

Ring-down unit settings

Viking© Model DLE-300

Installation of the Viking© Model DLE-300 advanced line simulator with Lencore's Spectra i.Net® MPI board.

Front panel DIP switches:

1 down
2 down
3 down
4 down
5 down
6 up
7 up
8 down

Internal jumpers:

JP1 installed
JP2 installed
JP3 installed
JP4 installed
JP5 uninstalled
JP6 installed

- Remove internal jumper from JP5 and move it to JP6.

- All other internal jumpers leave as is.

Telephone Patch Cord:

Use a telephone patch cord to connect DEV-2 RJ11 to MPI RJ11 connector.

Use another telephone patch cord to connect DEV-1 to a single line telephone.

or

User telephone system:

PBX--------\
Trunk Port│-----> to DEV-1 RJ11
VoIP-------/

4. Installing Power Supply

A. Install the power supply.

  1. Mount the power supply unit to the wall. Use angle brackets and screws for mounting.

  2. Keep vent side and vents exposed!
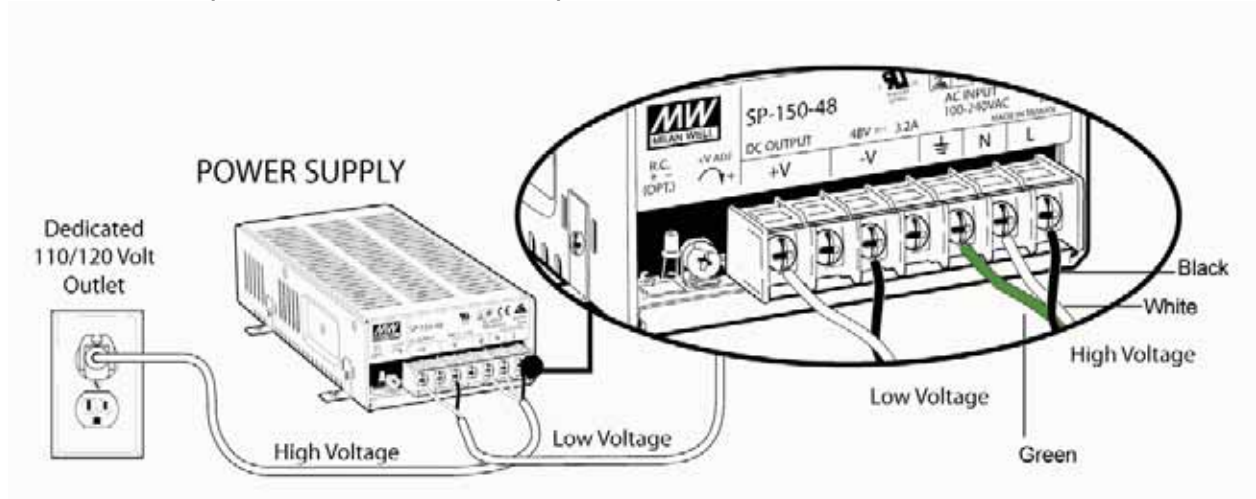
WARNING

NOTE: DO NOT PLUG IN UNTIL SYSTEM IS COMPLETELY WIRED AND CHECKED FOR POLARITY. Irreversible system damage will result if polarity is not kept.

NEVER PLUG AN MPI INTO ANY COMPUTER or NETWORK EQUIPMENT OTHER THAN AN i.Lon® OR SPECTRA i.NET® EQUIPMENT, UNLESS SPECIFICALLY INSTRUCTED TO DO SO IN THIS MANUAL.

WARNING

NOTE: NEVER WIRE or CONNECT POWER TO AN OP WHILE POWER IS ON!!! OP will lose its number identity. Always connect wire to OP while power is off.

5. Final Wiring Checklist

Final Wiring Checklist **BEFORE POWERING UP SYSTEM** Have you checked all home runs? Have you checked all wiring between floors (risers)? Are you sure all grounds are properly tied between power zones? Have you made sure all Data and Audio wires are tested? Check polarity of all wiring throughout, <u>especially power cables</u>. If continuity is reversed at any point, some or all of the OPs will be irreversibly damaged.	☐ YES ☐ YES ☐ YES ☐ YES

NEVER WORK WITH WIRE, OR CONNECT WIRES TO OP'S, WHILE POWER IS ON.

TIP! Check data wires by going to the i.Lon® and refreshing OP's after each OP is connected. This will help to eliminate large trouble shooting issues at the end of the job.

TIP! To check all speaker wires and speakers for good integrity, simply unplug the 1st speaker wire from the OP and connect an RJ45 to a 8 conductor CAT5 wire on one end and twist wire/pins 1,2 & 3 together and 4,5 & 6 together. This will give you two leads + & -. Attach an OHM meter to the wire with the leads and attach the other end into the first or last speaker in a run of speakers. If all is connected correctly, you will approximate the following correct results on your OHM meter:

For complete description, go to Spectra i.Net® Continuity Testing Diagram (Figure 7) at the end of the manual.

# of Speakers	OHMs*
1	32.4
2	16.5
3	11.3
4	8.8
5	7.3
6	6.4
7	5.8
8	5.3

*Values are approx. based on 25' cable run from OP to speaker and speaker to speaker.

MAKE SURE ALL OPs are wired correctly and follow continuity throughout THE ENTIRE SYSTEM. ALL +'s and –'s.

<div style="background:yellow">

DAMAGE CAN OCCUR!
IMPORTANT!

</div>

Check polarity of all wiring! If continuity is reversed with regard to the power CABLING (16 gauge, 2 conductor) at any point, some or all of the OPs will be irreversibly damaged.

MAKE SURE THAT between power zones a ground wire is ONLY installed connecting the separate power zones/supplies.

MAKE SURE THAT YOU have connected to each Power Supply the correct wire to the low voltage side AND that each wire is correctly connected to the appropriate and proper + and -. VISUALLY INSPECT AND DO NOT LEAVE TO CHANCE!

You may turn on each power supply in sequence.

Visually inspect to insure that either the i.Lon$^®$ server or MPI (if one is purchased for the project) is properly wired and installed.

ONCE YOU HAVE VISUALLY INSPECTED EACH ITEM AND ESTABLISHED CONFIDENCE THAT THERE IS CORRECT CONTINUITY THROUGHOUT THE POWER WIRING, YOU MAY PROCEED TO THE NEXT STEP!
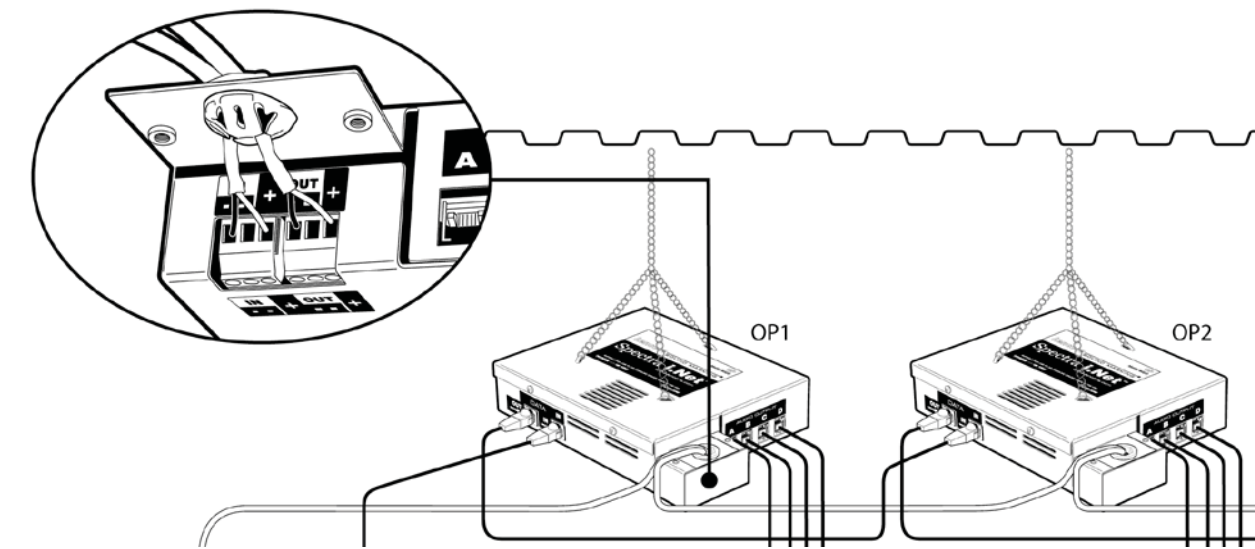
6. To Power the System:

1. Connect each power supply and i.Lon 100 Central Control Server and MPI to a dedicated 20 amp receptacle. Each dedicated circuit must be a 120V/20 amp.

    Once each item is connected, you may visually observe in the power supply a lit green LED, and sequencing of lights on the i.Lon® server and MPI.

    The i.Lon® needs approximately two minutes to completely boot up.

    Once the system is plugged in:

2. You will not hear any sound for approximately 30 seconds. The OPs count down from 20 to 0 before booting up. (This permits new software/firmware uploads and tracking of any corrupt data.)

Section 6 – Manual System Access & Tuning

A. Spectra i.Net® System will automatically default to the acoustical handbook's preferred curve.

B. Using a quality sound level meter to check the setting:

- Set the entire environment at 47.5 dBA as measured four feet above the finished floor. You can make adjustments using the Sound Manager or hand-held remote.

NOTE: This measurement should be accomplished in the evening or after normal working hours and the ceiling tiles should be 90-95 percent installed for an accurate reading.

C. For fine tuning:

- Leave all of the ceiling tiles that have an OP hanging above them exposed so that incremental adjustments can be made with the hand-held remote control prior to closing up the ceiling.

D. Use the hand-held infrared remote to make immediate adjustments to the volume and contour of each channel (A,B,C, and D) at each OP. You may press the ALL button on the remote to tune an entire OP if all of the speaker channels are in "like space."

- Aim the infrared remote control at the OP and press either the ALL button (All Channels), or an individual channel, A,B,C, or D.

- The LCD display will read the following for each:

  Button on Remote = LCD Display
  All = AL
  A=A
  B= b
  C=C
  D=d

You will also notice that the green LED light will stay lit while the remote is depressed, visually cueing that the remote is working and the OP is responding to the remote's signals.

When you are satisfied that the space has been tuned to the proper dBA level and has achieved proper sound uniformity, you can close up the remaining ceiling tiles to complete the project. Remove any debris created on site and contact your project team leader or Lencore to let them know the work has been completed.

Tuning the sound masking correctly is extremely important. The measure of the projects success will be measured by the quality of the sound. Ensure that the correct and appropriate amount of time is spent tuning and fine tuning the entire project.

1. Using the hand-held remote control:

Point remote at IR Eye

Point Remote at IR Eye located on the OP
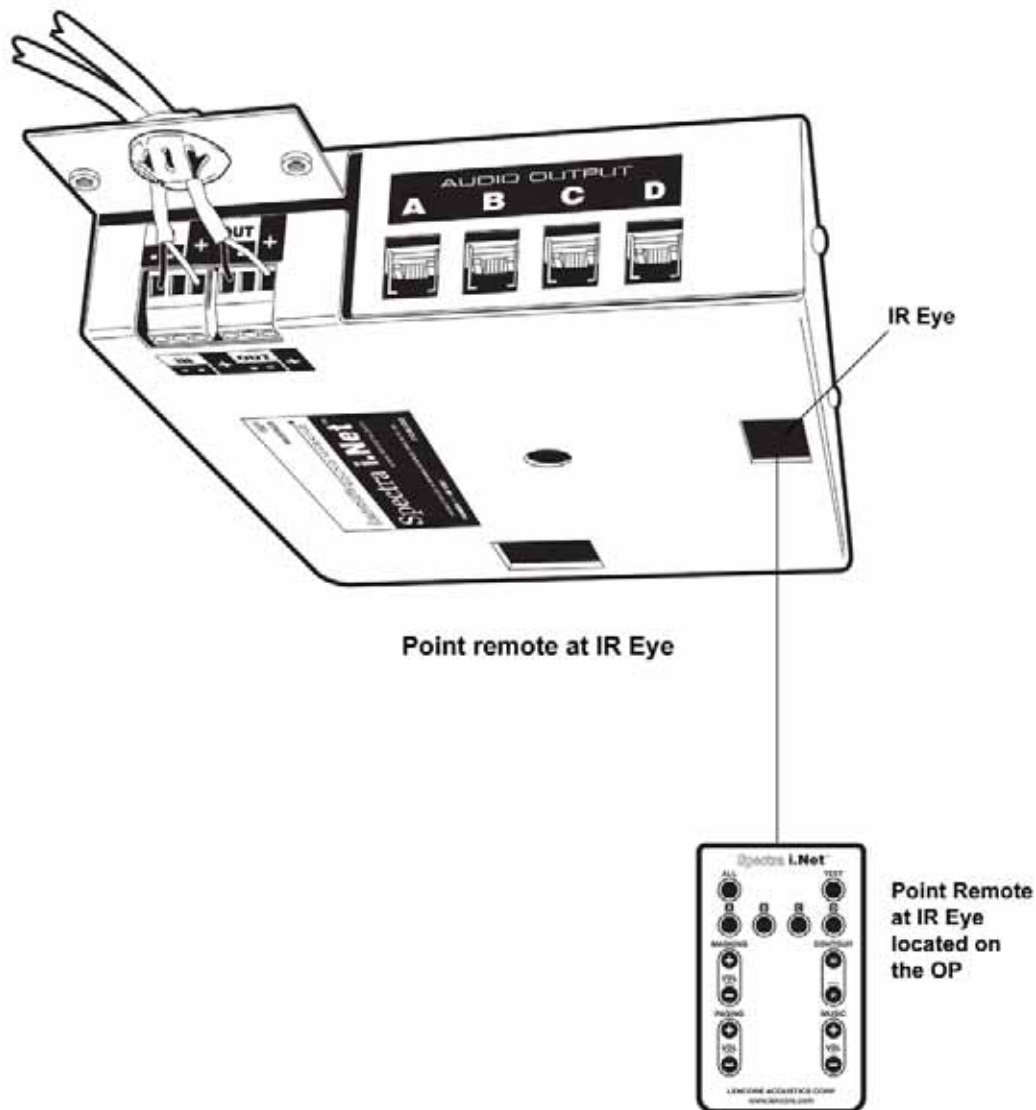
Using the Hand Held Remote

Each OP is equipped with an integrated infrared eye on the bottom of the OP enclosure allowing remote usage and connectivity. Using the Spectra i.Net® hand-held remote control point the remote to the bottom of the OP enclosure for IR line of sight control. Adjustments to the OP may be made from the remote control for masking volume and masking contour or paging volume or music volume by either single audio channel or entire OP.
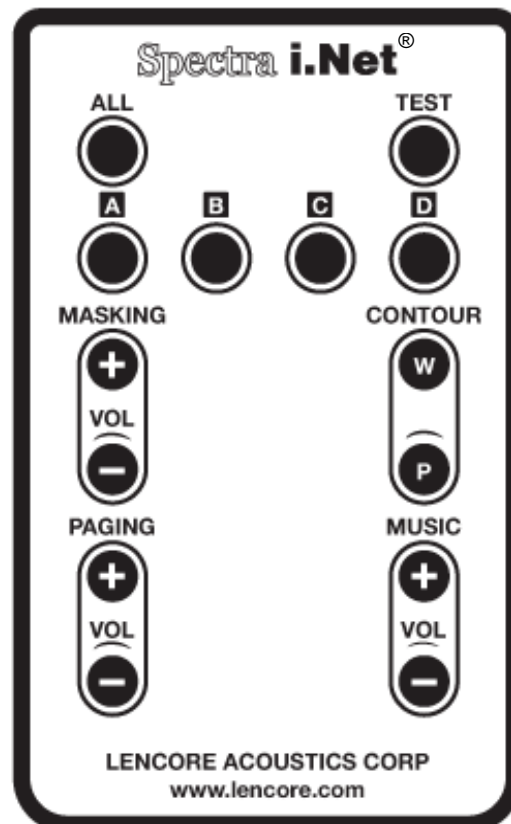
Section 7 – Installing to the IR port

IR port on the OP
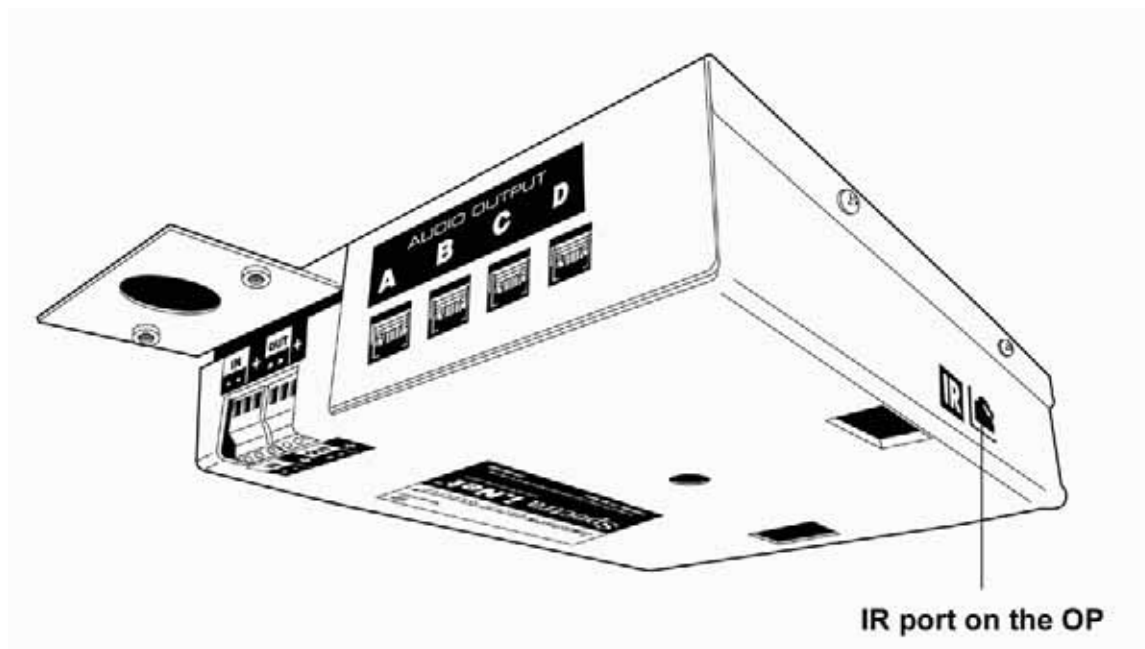
To hookup an on wall remote using the OP IR port….

The on-wall IR eye uses CAT 5e wire with a terminated RJ45 @ the end of the wire that is installed at the OP.

Insert the RJ45 into the IR port located on the OP.

ceiling

Wall Port
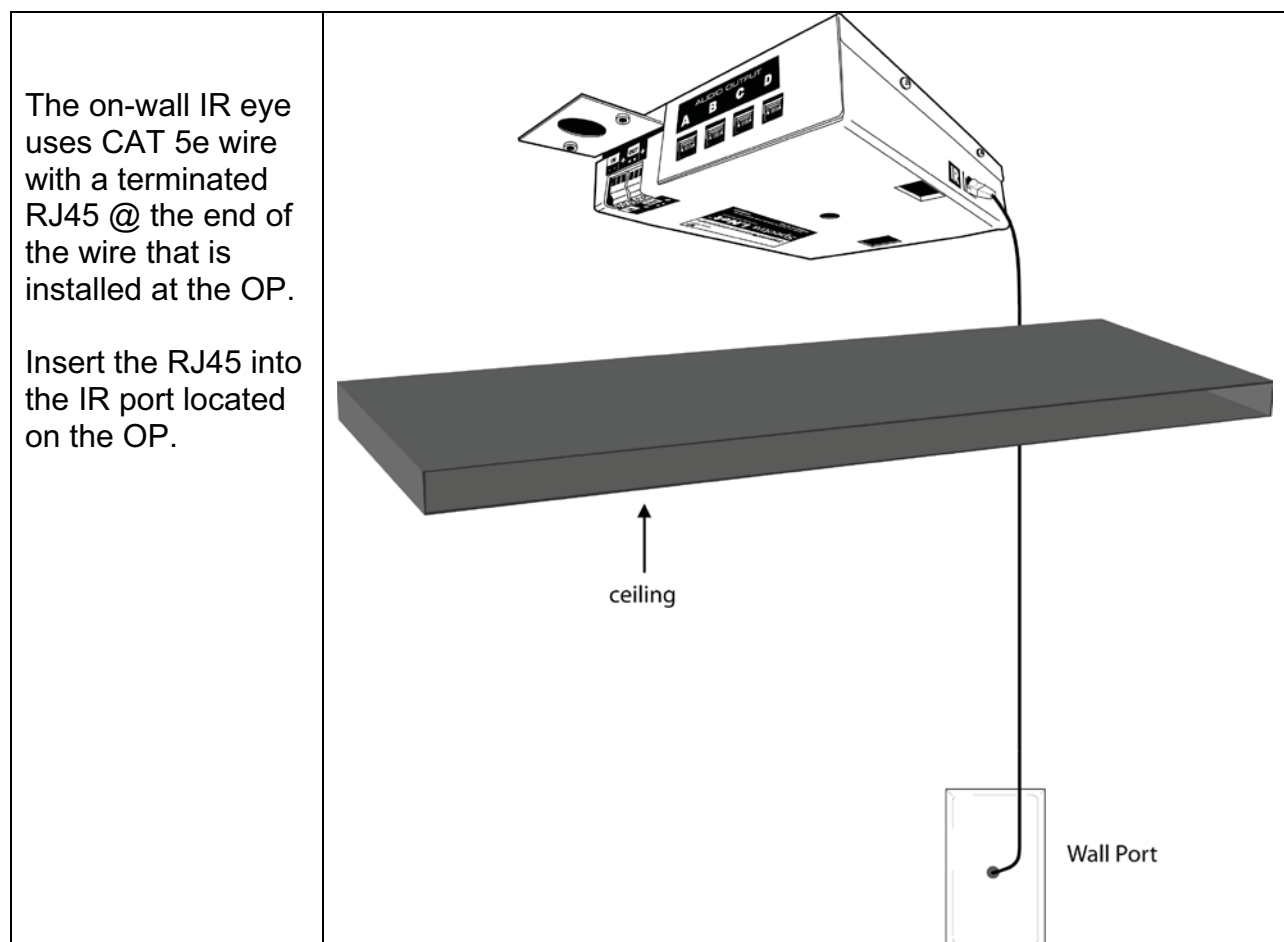
IR Hub – Connecting to more than one IR wall plate.

When installing more than one IR wall plate to an OP use the IR Hub as shown below.
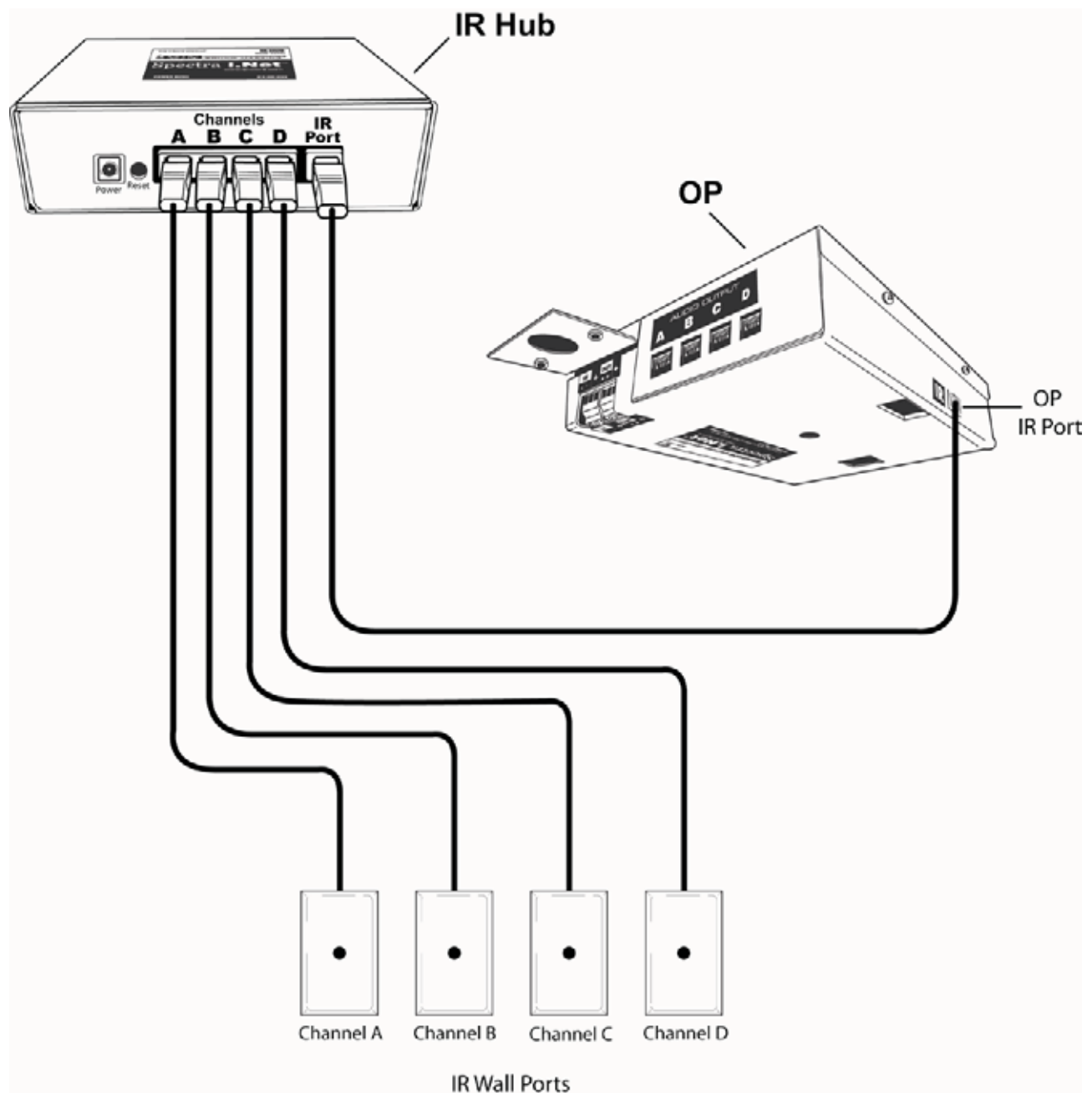
Section 8 – Wiring Schematics

Schematic 1
Spectra i.Net® Sound Masking
1-6 OP's with Data Terminal
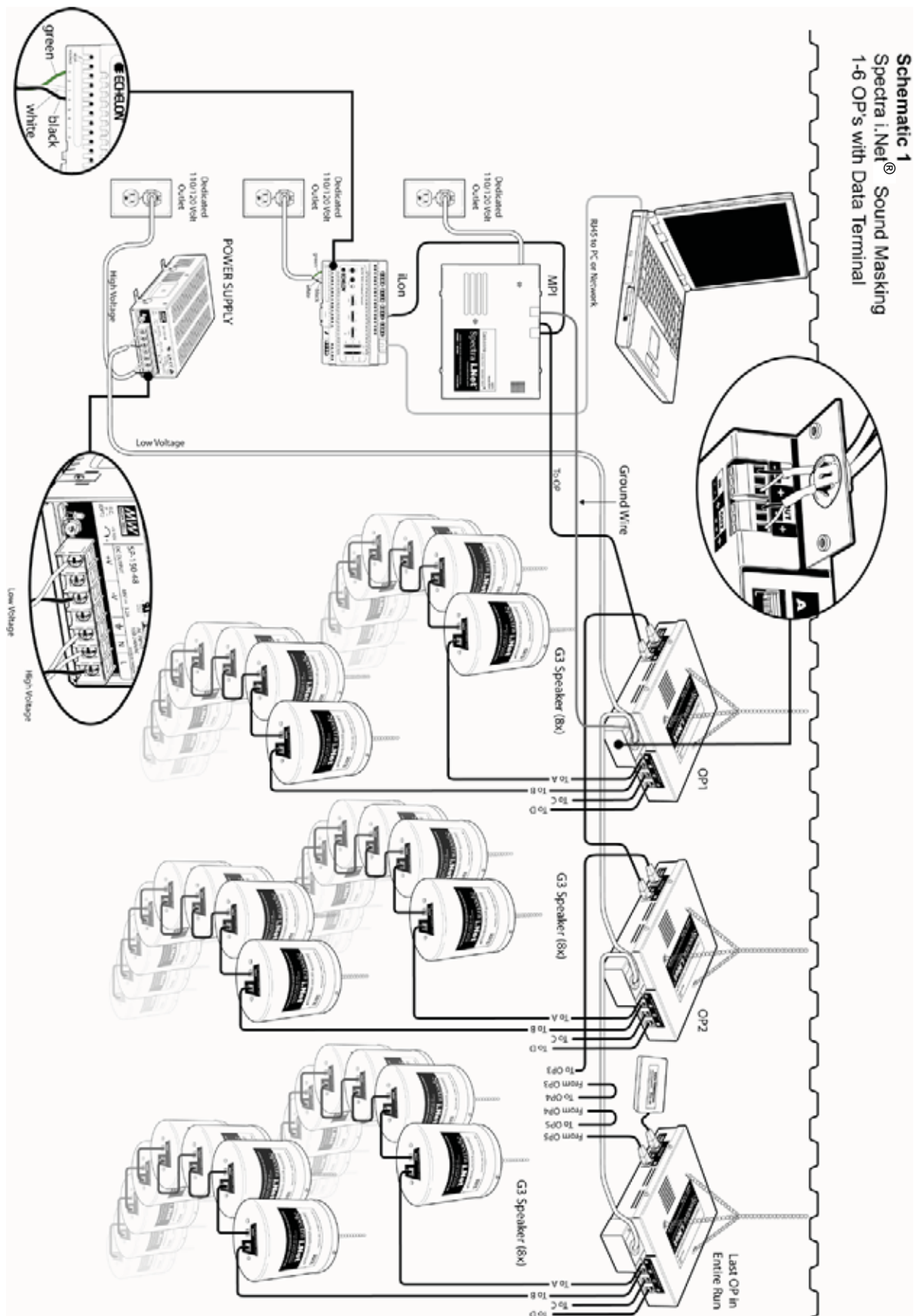
Schematic 2
Spectra i.Net® Sound Masking
Seperate Power Supplies with Common Ground Between Zones

End of Power Zone

Common Ground

From OP

Beginning of New Power Zone

Common Ground

To Next OP

Power Supply

OP6

OP7

Common Ground 1 Conductor/ Wire

From OP5

Power From OP5

To OP8

To OP8

G3 Speaker (8x)

G3 Speaker (8x)

To D

To C

To D

To C

Dedicated 110/120 Volt Outlet

Low Voltage

NEXT ADDITIONAL POWER SUPPLY

High Voltage
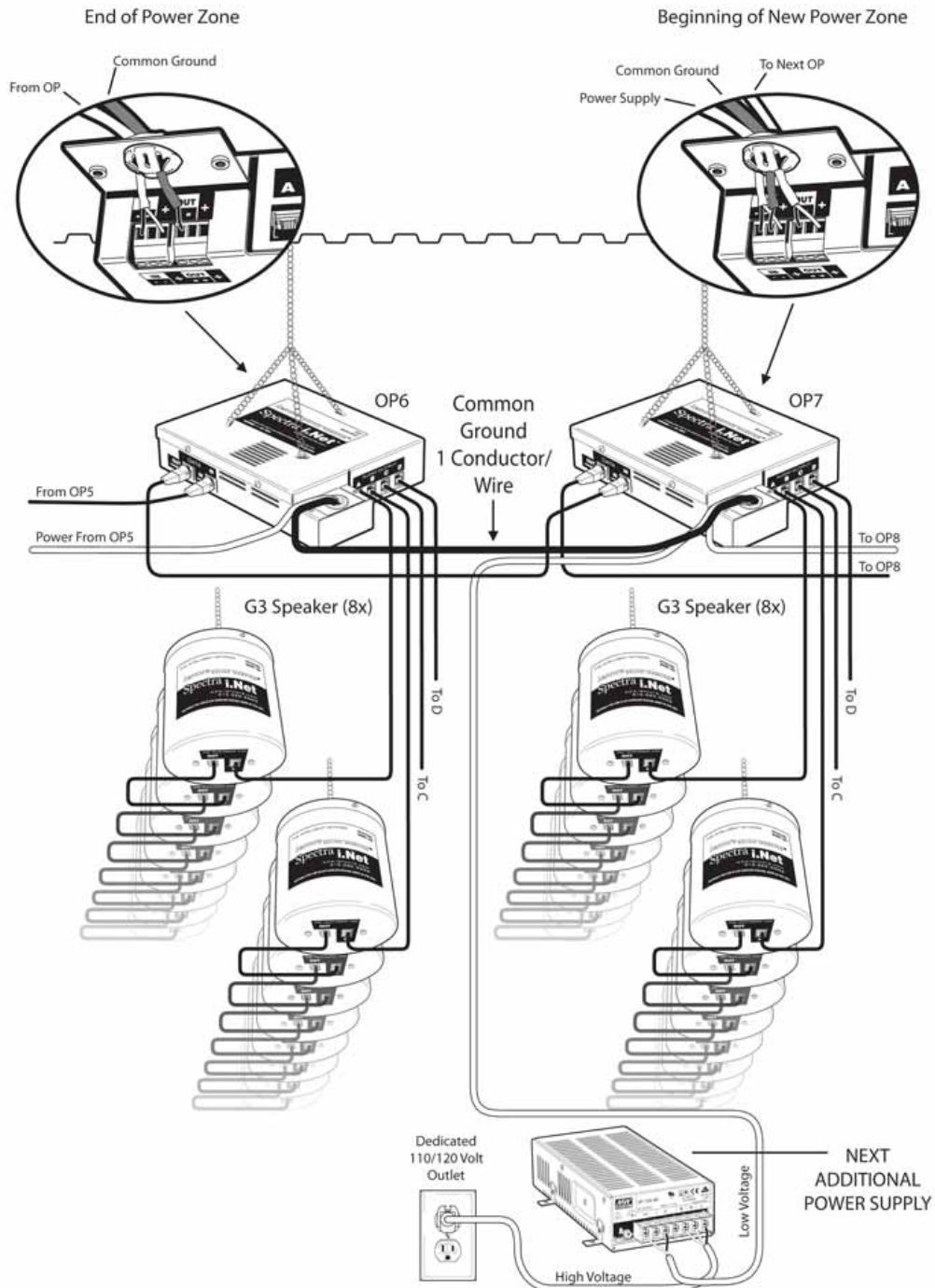
Schematic 3
Spectra i.Net® Sound Masking
Using a Router

OP

OP

From Previous OP

Power From Previous OP

To Next OP

To Next OP

G3 Speaker (8x)

G3 Speaker (8x)

Data In

Spectra i.Net™

Data Out

Option 1
use wire
input
Input 16-25
VAC or VDC,
2VA
Power - +

Audio Ground

Music

Paging

Power
Choose Option 1
or Option 2

Data In

Jumper

Data In

Paging

Music

Audio Ground

Option 2
use plug in
Input 16-25 VAC
or VDC, 2VA
Power
5.5 mm O.D.
2.1 MM I.D.
Center +

Jumper

Data
Out

Power
Choose Option 1
or Option 2

Data Out

Router Settings

Lencore Router Jumper Description

```
J1    Echelon router board        No settings required.
J2    Power Jack                  24VAC or DC, 300 mA
J3    Data cable input            Cat5e
J4    Data cable output           Cat5e
J5    Network input  terminator   Jumper in pin-1, pin-2, default
J6    Network output terminator   Jumper in pin-1, pin-2, default
J7    Page / Music bypass         See description below, all jumpers out default
J8    Page / Music screw terminal in   See description below
J9    Page / Music screw terminal out  See description below
J10   Power screw terminal        24VAC or DC, 300 mA (parallel with J2)
J11   Page  termination           Jumper in pin-2, pin-3, default
J12   Music termination           Jumper in pin-2, pin-3, default
```

In almost all installation scenarios, J5 and J6 are terminated in their default position. An exceptions might be if an external termination is used for some reason.

Scenario 1: Sound masking only or page / music volume and EQ adjusted by OP's.
        (i.e., No external amplifier or external EQ.)

```
J7    Jumper in pin-1, pin-2      Ground2, Ground1 bypass, connects both grounds.
      Jumper in pin-3, pin-4      Music- bypass, connects music- in to music- out.
      Jumper in pin-5, pin-6      Music+ bypass, connects music+ in to music+ out.
      Jumper in pin-7, pin-8      Page-  bypass, connects page-  in to page-  out.
      Jumper in pin-9, pin-10     Page+  bypass, connects page+  in to page-  out.

J8    1-4 Nothing connected       RJ45 J3 handles the page / music lines.
      5 - Ground                  Connect to (-) power of last OP (i.e., OP30).

J9    1-4 Nothing connected       RJ45 J4 handles the page / music lines.
      5 - Ground                  Connect to (-) power of first of additional OP's
                                  (i.e., OP31).

J11   Jumper in pin-2, pin-3      Leaves page lines unterminated.
                                  Last OP will have the external termination.
J12   Jumper in pin-2, pin-3      Leaves music lines unterminated.
                                  Last OP will have the external termination.
```

Scenario 2: Sound masking, page and music
        Audio volume and EQ adjusted by an external amplifier and /or EQ.

```
J7    Jumper in pin-1, pin-2      Ground2, Ground1 connected, recommended.
      Jumper in pin-3 only        Music- in isolated from music- out.
      Jumper in pin-5 only        Music+ in isolated from music+ out.
      Jumper in pin-7 only        Page-  in isolated from page-  out.
      Jumper in pin-9 only        Page+  in isolated from page-  out.

J8    1 - Page+      Connect to balanced+ input of amplifier/EQ (i.e., left  channel+)
      2 - Page-      Connect to balanced- input of amplifier/EQ (i.e., left  channel-)
      3 - Music+     Connect to balanced+ input of amplifier/EQ (i.e., right channel+)
      4 - Music-     Connect to balanced- input of amplifier/EQ (i.e., right channel-)
      5 - Ground     Connect to (-) power of last OP (i.e., OP30).
```

```
J9    1 - Page+          Connect to balanced+ output of amplifier/EQ (i.e., left  channel+)
      2 - Page-          Connect to balanced- output of amplifier/EQ (i.e., left  channel-)
      3 - Music+         Connect to balanced+ output of amplifier/EQ (i.e., right channel+)
      4 - Music-         Connect to balanced- output of amplifier/EQ (i.e., right channel-)
      5 - Ground         Connect to (-) power of first of additional OP's (i.e., OP31).

      If an amplifier(s), such as two TOA BG1015's are used, with high impedance balanced
      inputs, then...
J11   Jumper in pin-1, pin-2              Page  lines are terminated here.
J12   Jumper in pin-1, pin-2              Music lines are terminated here.


      If another amplifier or EQ that has 600 ohm low impedance balanced inputs then...
J11   Jumper in pin-2, pin-3              The amplifier will provide the page  termination.
J12   Jumper in pin-2, pin-3              The amplifier will provide the music termination.
```

- You must open the router housing to adjust any jumper settings. To open the router, unscrew all three outside green screw terminals and pull terminals off the router housing (power, jumper in and jumper out).

- Then unscrew one side and slide off housing top.

- Then slide PC board out of housing (make sure you are personally discharged of any and all static electricity before handling a raw PC board).

- Make necessary jumper changes or modifications.

- Put unit back together.

Router PC board showing jumpers
(J1- J12).

Schematic 4
Spectra i.Net® Sound Masking
Connecting the i.LON, MPI and OP

Data Wires must be in left & right holes. The middle hole does not work.

OP

Next OP

To OP

Ground Wire to MPI

(Use only one wire for ground DO NOT hook up positive (+) wire to the MPI)

MPI

Sequencer Button

On/Off Switch

L/R Stereo Input

Line Level All Call*

Power Supply 7.5 VDC

Telephone Input

To i.LON

Dedicated 110/120 Volt Outlet

i.LON

ECHELON

Power to OP

POWER SUPPLY
(48 VDC Power Supply)

Dedicated 110/120 Volt Outlet

Dedicated 110/120 Volt Outlet

Low Voltage

High Voltage

*Line level will not work unless specifically commissioned by the factory.

Schematic 5A, 5B, 5C
Spectra i.Net® Sound Masking
i.LON 100® Close Ups

5A. Top View
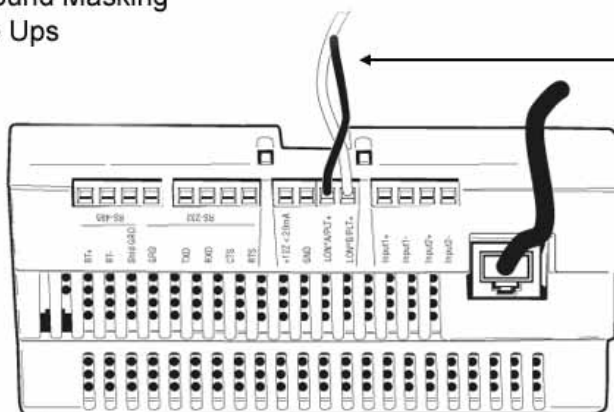
Use terminal 17 & 18
for data connection to
MPI or OP if no MPI
exists

5B. Front View

2 Conductor Wire,
16 gauge, goes from
i.Lon, #17 & #18,
to either MPI or if no
MPI exists use CAT 5e
cable (24 awg) and
connect orange &
orange/white to pin #17
& #18.

Use terminal #17 &
#18 and use the
orange and
orange/white
wires (pin 1 & 2)
from your CAT 5e
cable for network
connectivity if you
are connecting
straight to an OP.
Otherwise connect
#17 & #18 using two
conductor wire to the MPI

(Network polarity does NOT
matter)

i.LON™ 100 Internet Server

ECHELON®

Green
White
Black

RJ45 & Ethernet Cable
for laptop or clients
network

5C. Bottom View

Green
White
Black
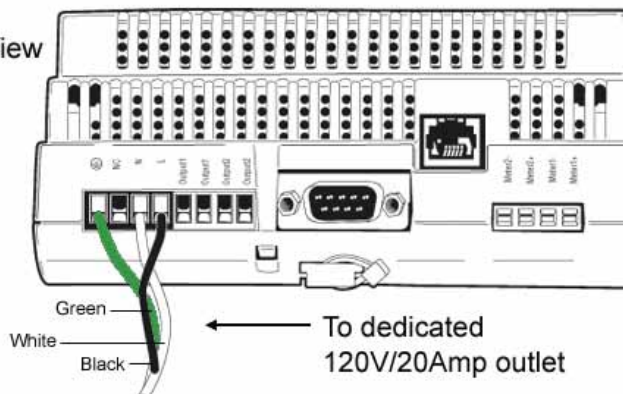
To dedicated
120V/20Amp outlet

Schematic 6A
Spectra i.Net$^®$ Sound Masking
OP Wiring for Power

OP1
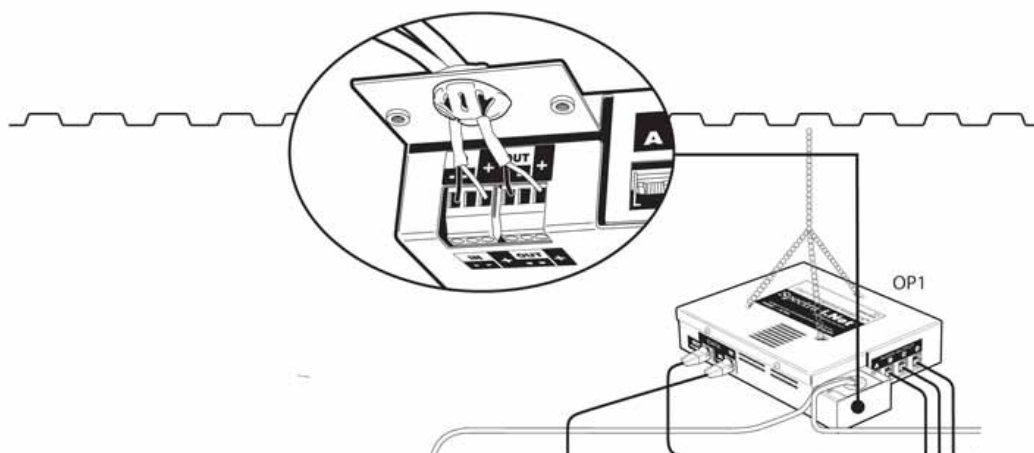
Schematic 6B
Spectra i.Net$^®$ Sound Masking
Power Supply Wiring

POWER SUPPLY

Dedicated
110/120 Volt
Outlet

Low Voltage

High Voltage

SP-150-48

Black
White

High Voltage

Low Voltage

Green

Schematic 7
Spectra i.Net® Sound Masking
Dry Contact – Mute & Unmute Schematic

Connect to dry contacts to mute and unmute masking.
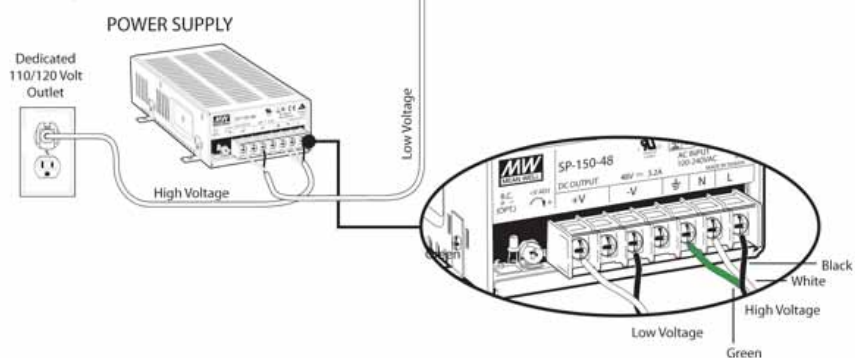
7. Top View

+

−

Jumper wire from Pin #16 to Pin #20

28 27 26 25   24 23 22 21   20 19 18 17   16 15 14 13

i.LON™100 Internet Server

LAN   LON

Link   Connect

Power

Wink   Service   Meter   Input   Output

ACT   BI/RX

100   PHO/TX

1 2   1 2   1 2

ECHELON

HIGH
VOLTAGE   1 2 3 4 5 6 7 8   CONSOLE   9 10 11 12

Green
White
Black
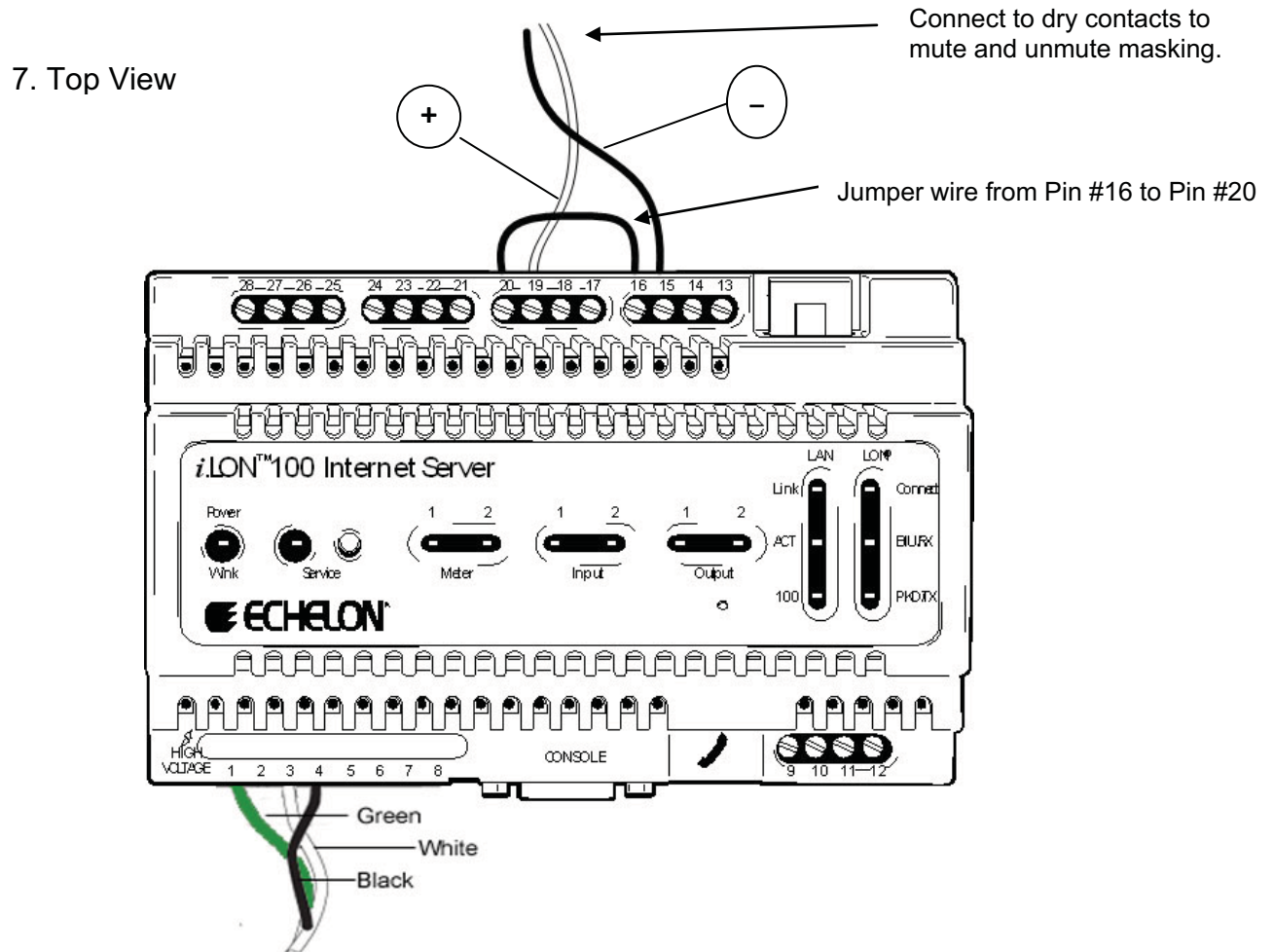
The i.Lon® offers the ability to quickly mute & unmute the sound masking for the entire system via inputs # 15 & # 19, Input: (input 1- = 15, input 1+ = 19)

Connect a jumper wire from Pin #16 to Pin #20.

Connect the digital input to a set of dry contacts to mute and unmute.

Spectra i.Net® Continuity Testing Diagram *(Figure 8)*

Operating Platform (OP)

Cables from OP to Speakers

Speaker Continuity Test Device
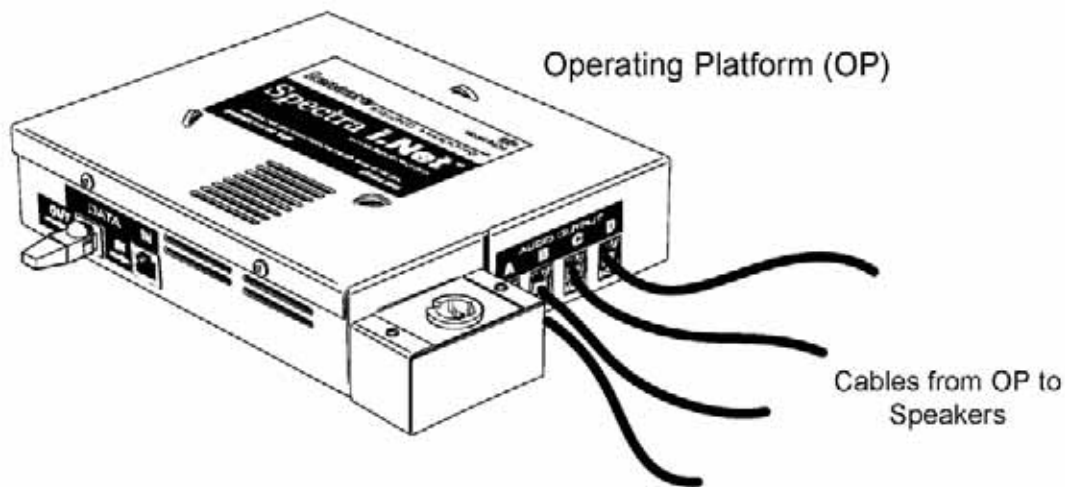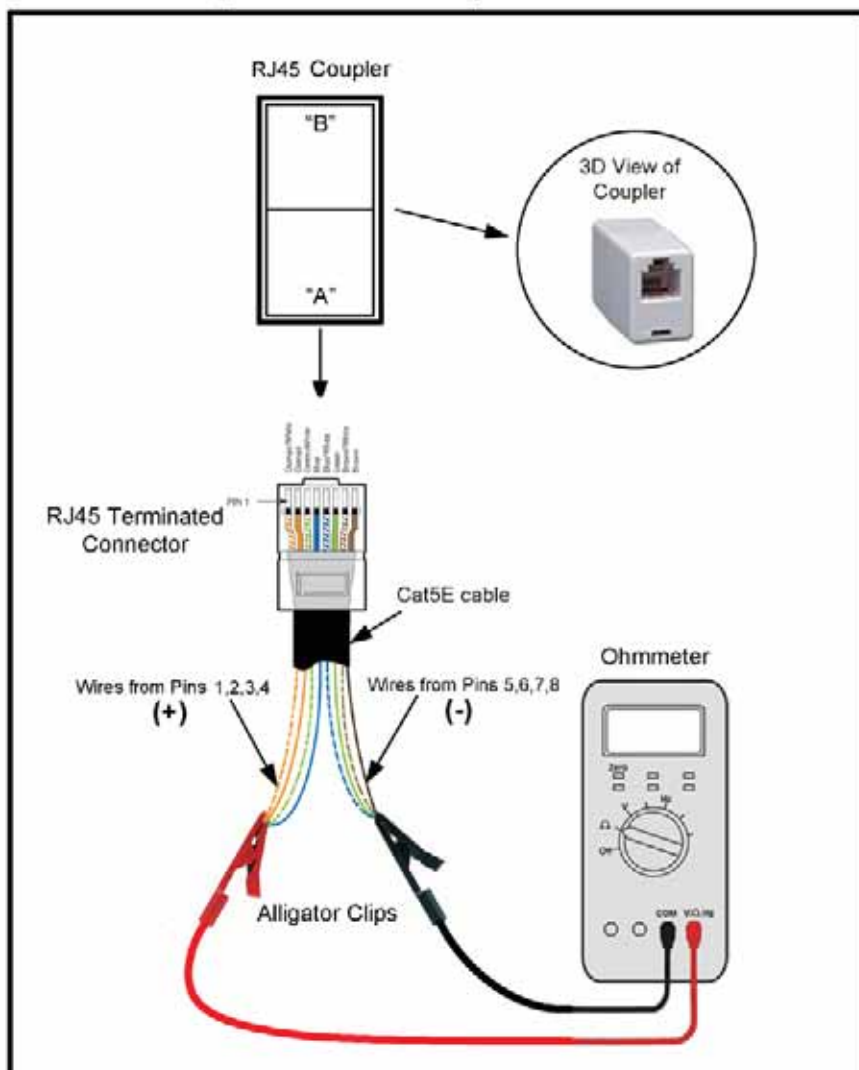
RJ45 Coupler

"B"

3D View of Coupler

"A"

RJ45 Terminated Connector

PIN 1

Cat5E cable

Wires from Pins 1,2,3,4
(+)

Wires from Pins 5,6,7,8
(-)

Ohmmeter

Alligator Clips

Detach each RJ45 connector individually and place into end "B" of RJ45 coupler of test device (shown at left).
Measure Ohmmeter readings for each channel cable per chart below to ensure continuity between cable and speakers.

Ohmmeter Readings

# of Speakers	OHMs*
1	32.4
2	16.5
3	11.3
4	8.8
5	7.3
6	6.4
7	5.8
8	5.3

* Values are approx. based on 25' cable run from OP to speaker and speaker to speaker.

Spectra i.Net
System Components

Lencore
Acoustics Corp.

Typical Sound Masking Units
(G19's shown)

Power To Next OP

Power from Previous OP

OP – G20
(31st OP shown)

Located at last OP
Terminator –
G21

Data Out

Router – G20
(Used after every 30th OP)

Data In

Power To Next OP

Power From Power Supply
or previous OP

CEILING / PLENUM MOUNTED EQUIPMENT

Data Cable (RJ45) to OP (Data IN)

Ground Strap to OP (-) terminal

Single Conductor

To OP
(Data In)

To OP
(-) terminal

To 'INT'
Port

Data-OUT to next
OP or Router-IN

OP – G20
(30th OP shown)

Data-IN cable from previous OP or i.LON

Power To Next OP

Power From previous OP or i.LON

IR Hub (Option) – G482

Paging Horns (If Required)

MANUAL CONTROLS

Handheld
Remote – G16

Typical Laptop or PC

IR Wall Port (Option) – G42

Network RJ45 Cable from i.LON

To MPI*

* - If MPI is NOT used, wires (Orange and White/Orange) from "Data Input RJ45" of
nearest OP are connected to these terminal locations (17 and 18)

– Network RJ45 Cable to Computer or Network Hub/Router

To i.LON

i.LON – G13
Factory preset
IP 192.168.100.225

Sequencer Button (Recessed)
Do NOT Press

110 VAC Input:
From outlet

MPI – G05
(Option)

On/Off Switch

L/R Stereo Input

Line Level All Call
(Must be Factory ordered)

Power Supply 7.5 VDC

Telephone
Input

PMX Trunk
Appearance

Ring Down
Unit

Trunk Line

- OR -

POTS, 2 wire
Loop start

POTS Line

DTMF tones MUST BE ENABLED

PAGING ZONES:
Dial 00# (ALL Call)
01# (Zone 1)
02# (Zone 2)
etc.

EQUIPMENT TYPICALLY LOCATED IN
ELECTRICAL, TELECOM OR I.T. CLOSET

Dedicated
110/120 Volt
AC Outlet(s)

Power Supply – G14

High Voltage

Low Voltage

48 VDC
"+" and "-" Power wires to OPs
(Must maintain proper polarity)
(Limit 8 OP's per Power Supply)

Network RJ45 Cable from i.LON

Typical OP Channel cable
(RJ11 Connector is removed
from AMP end of cable)

When Paging Horns are required:

AMPLIFIER (L115 Shown)

Section 9 – Lencore Contact Information/NOTES

NOTES

<u>NOTES</u>

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